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EDITOR:

PROF. SIR FREDERICK HOBDAY, C.M.G., F.R.C.V.S., F.R.S.E.

DR. MED. VET. h.c. (ZURICH),
HONORARY VETERINARY SURGEON TO HIS MAJESTY THE KING,
OFFICIER DU MÉRITE AGRICOLE (FRANCE),
CAVALIERE DEI SS. MAURIZIO E LAZZARO (ITALY),
HONORARY MEMBER OF THE AMERICAN VETERINARY ASSOCIATION,
PRINCIPAL AND DEAN OF THE ROYAL VETERINARY COLLEGE, LONDON

SUB-EDITOR:

GLADSTONE MAYALL, M.R.C.V.S.

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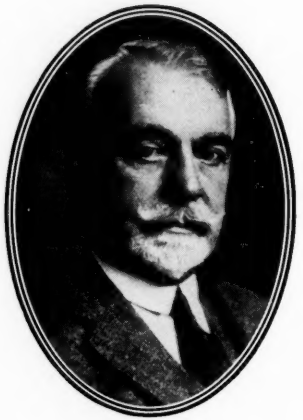
The late PROFESSOR P. J. CADIOT, a former Director and Professor of Surgery of the Alfort Veterinary School, Paris.



The late PROFESSOR DR. FRANZ VON HUTYRA, formerly Rector and Professor of Pathology and Infectious Diseases of the Royal Hungarian Veterinary School, Buda-Pesth.

The late CAPT. RICHARD SCOTT, M.R.C.V.S., a successful and much respected general practitioner.

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JANUARY, 1935.

Obituary

BY the deaths of Professors Cadiot and Hutyra the Royal College of Veterinary Surgeons loses two of its most distinguished Honorary Associates, and the countries of France and Hungary respectively each lose a leader whose name was a household word in veterinary circles, not only in his own country, but throughout the civilised world.

Born in 1858, Cadiot entered the famous veterinary school at Alfort in 1875, and took his Diploma in 1879. After qualifying he was attached as assistant to the Chair of Surgery and Obstetrics, becoming eventually Professor, and ultimately Director of the school. Always a keen operator and an indefatigable worker, Professor Cadiot inspired his students with his own enthusiasm, and the veterinary profession in France owes much to his example. His literary contributions included numerous text-books on Clinical Surgery, and the pages of the *Receuil de Médecin Vétérinaire*—now the printed organ of the Veterinary Academy of France—were frequently enriched by articles from his pen. For the last few years Professor Cadiot was in retirement, but, nevertheless, always accessible to his friends; and his name will ever be remembered by his grateful students. Professor Cadiot was elected an Honorary Associate of the R.C.V.S. in 1897.

THE name of Professor Franz von Hutyra is especially known as a household word in veterinary circles from its association with that of Professor Marek in the well-known work on "Special Pathology and Therapeutics of the Diseases of Domestic Animals"; which, originally written in German, has been translated

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into both French and English, and has become the recognised reference veterinary authority on this subject in every country of the civilised world.

Born in 1860, Hutyra took his diploma in human medicine in 1883, graduating afterwards in veterinary science, and taking up an academic post very shortly afterwards in the Royal Hungarian Veterinary School at Buda-Pesth. As might be expected from a country so dependent on animals and agriculture, the veterinary school occupies a position of great importance in Hungary, and Hutyra quickly grasped the opportunity to apply patient research in veterinary science to the control of animal epidemics and disease.

It was largely owing to his personal efforts that the Veterinary College eventually found an official status within the University—his own reward being a place in Parliament and amongst the titled ranks of his country—but he was unable to accomplish his life's wish that there should be created a Faculty of Veterinary Science *per se*, as the Government authorities insisted that Agriculture should be its stable companion—the position which exists at the present time.

To us in Great Britain, Professor Hutyra's name is also well known for the active and courteous part which he took in the International Veterinary Congress when it was held four years ago in London. Professor Hutyra was the Chairman of the Council, and his dignified bearing and courteous manner made him a welcome companion wherever he went. He was elected an Honorary Associate of the Royal College of Veterinary Surgeons in 1914.

Capt. Richard Scott, the third of the photographs on our frontispiece, was one of " the backbone " of the profession, for that is the description so truthfully and frequently applied to the practitioner—and Richard Scott was one of the best of the type. His death at the early age of fifty-eight came as a great shock to his clients and friends, and his loss will be much felt throughout Aldershot and district.

Graduating from the New College, Edinburgh, in 1901, after gaining some experience as assistant in various practices, Mr. Scott settled down at Aldershot, where his attention and skill rapidly collected around him a large and influential *clientèle*, especially amongst the owners of dogs, who used to send very long distances for his services. Always ready to utilise his services in the cause of the sick and suffering animal, he never spared himself, and the respect in which his name was held amongst his brother practitioners was evidence of his upright character. Such men do honour to any profession, and give examples which the younger generation will do well to study and follow.

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Editorial

THE TUBERCULOSIS (ATTESTED HERDS) SCHEME FOR ENGLAND AND WALES.

As the arrangements for the recently issued Tuberculosis (Attested Herds) Scheme for England and Wales comes into operation on February 1st of this year, we draw the attention of our readers to certain sections of the Milk Act which are published in this month's pages.

The origin of this further addition to the laws and regulations which govern the output of milk is, of course, the intensive Government effort which is at last being put forth to try to produce a milk supply which is not only safe for children, but clean and definitely free from tubercle bacilli.

Under certain circumstances the Ministry of Agriculture is prepared to undertake the testing with tuberculin of herds of cattle of any registered producer in England and Wales, and, if no reactors are found, to issue certificates of attestation in respect of the individual herds, subject to the observance of certain rules by the owners. All the cattle (including calves) comprised in the herd must be submitted to the test, and, if satisfactory, the owner has the right to have his herd entered on the list of tuberculosis-free attested herds; whilst he himself may, upon application, be awarded a certificate to say that he has become a "Registered Producer" under the Milk Marketing Scheme. This certificate is valid for one year, and can be renewed, if desired by the owner of the herd, after a further official test of all cattle; provided that no reactors are disclosed and the Ministry is satisfied that the herd and the premises continue to be suitable for attestation. The Act provides for what is to be done in the event of reactors being found, and the official tests are carried out without charge to the owner.

The chief trouble which has militated against the encouragement of private enterprise has been the apathy of the general public; as there has been such difficulty in persuading them to pay any higher price for milk from a tubercle-free herd. Their apathy is amazing; but this pecuniary disability will now be done away with, as the Government will pay a bonus to the owner of one penny per gallon for all milk sold from such herds, under the provisions of the Milk Marketing Board.

The Act (*see* pages 28–35) gives full and explicit details in regard to the keeping of dairy records, the precautions to be taken when the animals are travelling by rail, and for the disinfection of vehicles; also the regulations which control even the carrying of milk to the premises of another herd. It is intended as an encouragement to the efficient owner, and it is to be hoped that it will help towards that much discussed question " the eradication from the dairy herds of the tuberculous cow."

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General Articles

AN ATTEMPT TO TRANSMIT ANAPLASMOSIS BY BRITISH BITING FLIES.

By E. L. TAYLOR.

Veterinary Laboratory, Ministry of Agriculture and Fisheries.

THE claim of American investigators[1] to have transmitted anaplasmosis through the agency of biting flies raises a point of considerable importance to countries free from anaplasmosis, in connection with the possible spread of this dangerous bovine disease from imported carrier cattle, and is of particular concern to an Institute, such as this one, where carrier cattle are kept for the purpose of immunising animals for export to foreign countries in which the disease is endemic.

Of the three North American species of fly (*Tabanus gracilis, T. sulcifrous* and *T. venustus*) which the American workers have found to be capable of transmitting the disease, none occurs in this country, nor does any one of the other three species (*T. fuscicostatus, Chrysops sequax* and *Silicius pollinosa*) which they employed, along with the three species previously mentioned, in two instances of successful transmission. As, however, there is no reason to suppose that the transmission of anaplasms by flies is anything more than a mechanical one, any biting fly capable of transferring sufficient blood on its mouth parts presumably might be capable of acting as a vector of the disease.

Inquiry into the practicability of rearing tabanid flies in the laboratory for the proposed experiments showed that no great difficulty was to be anticipated, but it is the general experience that those flies which have been reared under artificial conditions will not feed, the suggested reason for this being that the females require first to be fertilised. This act cannot be induced in the laboratory, probably taking place, under natural conditions, high in the air ; and on this account it was necessary for the purpose of the experiments to resort to the use of captured flies. As, however, the principal object was to ascertain whether anaplasmosis could *in any way* be transmitted by flies, and as the disease does not occur naturally in this country, the reason for rearing the experimental flies under laboratory conditions could not be regarded as important, and the necessity to resort to the use of captured tabanids does not detract from the value of the results which have been obtained.

The species of *Tabanus* and *Chrysops* (an allied genus of flies common in some parts of this country) are not of frequent occurrence on the laboratory farm, but *Hæmatopota pluvialis*, commonly known as the " cleg," is often seen during the early part of the summer. The genus *Hæmatopota* is closely allied to *Tabanus*, belonging to the same sub-family, and this fly therefore appeared to be suited to

the experiment, its comparative prevalence at the laboratory lending it a particular interest in connection with the domestic problem of the possible transmission of infection to cattle in the immediate vicinity. *Stomoxys calcitrans* was used in a later series of experiments for the same reason.

Method of Handling Hæmatopota pluvialis.—Preliminary trials showed that the best way of handling these flies was to keep them separately in large centrifuge tubes inverted on cards, and to apply them directly to the skin of the experimental animal without the use of mosquito netting, which appeared to hinder them in finding a suitable place to bite. Between feeds they were kept in the cold room at about 40° F. (to prevent them from wasting their energies in too great activity), and were brought into the laboratory half an hour or more before each feed. The flies were then placed on a part of the skin on the experimental animal (from which the hair had been clipped) by sliding the card from under the tube, and note taken of the length of time during which their mouth parts remained actually buried in the skin. After having been allowed to feed for a certain pre-arranged time on the infected animal, each fly was removed to the uninfected animal, and allowed to feed in the same way. In most of the attempted transferences this removal of the fly from one animal to the other was carried out with as little delay as possible, as it was thought that infection might thereby be more likely to result.

Particulars of all the experimental feeds are given in Table No. 1. As the work proceeded, the feeding times were shortened, and the flies given the opportunity of repeating the double feed, in order to increase the number of supposedly infective bites; one fly in this way actually took four double feeds on the one morning. In several instances a spot of blood was noticed to appear at the point where the fly had pierced the skin, and it is interesting to note in passing that a marked local reaction at the site of the bite was always produced in the one animal (the infected one), but not in the other animal, doubtless an instance of individual susceptibility to some irritating substance in the saliva of the fly.

Method of Handling Stomoxys calcitrans—the Stable Fly.—Flies of this species are very prevalent about the farm buildings at the laboratory, and it was found to be a comparatively simple matter to catch 100 within an hour. As these flies could be secured so easily, it was decided, instead of using them singly, to use a number at one time in order to increase the likelihood of effecting the transmission of the disease.

After preliminary trials of various methods it was found that they could be conveniently handled in deep glass dishes of 6 in. diameter, the top of which was covered with mosquito netting; and that they could be kept alive satisfactorily if the glass dish were inverted over a small piece of wet cotton wool and placed in the dark at room temperature. When the flies were fed on the experimental animals the glass dish was inverted over a part of the skin from which the hair had been clipped, and held in position for the pre-arranged period—usually one minute. The flies fed very readily through the mosquito netting,

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TABLE No. 1.

HÆMATOPOTA PLUVIALIS.—TABLE GIVING PARTICULARS OF THE DURATION OF FEEDS, IN MINUTES, ON INFECTED AND UNINFECTED ANIMALS.

No. of Fly		Dates 28.7	29.7	31.7	1.8	2.8	3.8	4.8	5.8	8.8	9.8	10.8	11.8	14.8	15.8	16.8
1	X	3	2	1	—	—	1½	dead								
	*	3½	½	1	—	—	½									
2	X	2	1	1	1	—	1	1	—	—	1	—	1	—	—	—
	*	2	2	1	1½	—	1½	1	—	—	—	—	¾	—	—	—
3	X	1½	1	—	—	—	—	—	—	—	—	—	—	—	—	
	*	1½	—	1	—	—	—	—	—	—	—	—	—	—	—	dead
4	X	2	1	1	1	1	1½	¾	—	1	—	dead				
	*	2	2	1	1½	1½	—	1½	—	—	—					
5	X	—	—	—	—	—	—	—	—	—	—	—	1	—	—	
	*	—	—	—	—	—	—	—	—	—	—	—	1½	—	—	dead
6	X							1½	1 ¾	—	—	—	—	dead		
	*							1½	1½ —	—	—	—	—			
7	X							1½	1 1	1	1	—	¾	—	1	1
	*							2	1½ 1½	1	1½	—	¾	—	2	2
8	X								1 1½	1	—	—	¾	—	—	—
	*								¾ 1¾	—	—	—	1	—	—	—
9	X									1¼	—	—	—	—	dead	
	*									1½	—	—	—	—		
10	X										1	—	¾	dead		
	*										1½	—	1			

X Duration of feed on infected animals. * Duration of feed on uninfected animals.

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TABLE No. 1.—*continued.*

No. of Fly		Dates 28.7	29.7	31.7	1.8	2.8	3.8	4.8	5.8	8.8	9.8	10.8	11.8	14.8	15.8	16.8
11	X										1	—	¾	dead		
	*										—	—	1			
12	X										1	1	1	1	—	dead
	*										1½	—	1	—	—	
13	X										—	—	—	—	—	dead
	*										—	—	—	—	—	
14	X										1	—	—	dead		
	*										—	—	—			
15	X										—	—	1	dead		
	*										—	—	1½			
16	X										1	1	1			
	*										1½	—	1½	dead		
17	X										1	—	1	dead		
	*										—	—	1½			
18	X										—	—	—	—	—	dead
	*										—	—	—	—	—	
19	X										1	—	1	1	1	1
	*										—	—	1½	1	1½	1½
20	X										—	—	—	dead		
	*										—	—	—			

X Duration of feed on infected animals. * Duration of feed on uninfected animals.

and at the end of each feed the majority were seen to be swollen with blood, which gave a distinct red tinge to the under-surface of the abdomen. The transference of the flies from the infected to the non-infected animal was again made quickly in order that the test might be as rigorous as possible. In the latter part of this experiment two or more double feeds were given to each lot of flies; in one instance seven feeds on each animal, and in another instance four feeds, terminating with a feed of seven minutes on each animal. At the end of that time many of the flies had become satisfied, but some were still seen to be feeding.

The Strain of Anaplasm.

This was originally received from Dr. G. Fluckiger, of the State Veterinary Department, Berne, 17.2.32, and was inoculated into two animals, in which it produced typical reactions. A second passage was made 12.8.33, and a third made 23.10.33; this last produced a severe reaction from which the animal died, thus showing the strain to be virulent one.

First Transmission Experiment—using Hæmatopota pluvialis.—On June 24th the usual infective dose of 20 c.c. of defibrinated blood from an anaplasmosis carrier was injected subcutaneously into animal No. 539, resulting in the develop-

TABLE No. 2.

STOMOXYS CALCITRANS.—TABLE GIVING PARTICULARS OF THE DURATION OF FEEDS ON INFECTED AND UNINFECTED ANIMALS.

No. of batch of flies.	Approximate number of flies alive.	Date of feed.	Duration of feed on infected animal in minutes.	Duration of feed on uninfected animal in minutes.
1	300	6.9	1	1
1	250	7.9	2	3
1	150	8.9	3	4
1	100	9.9	3	4
1	75	11.9	2	3
1	75	12.9	1, 1, 1	1, 1, 1
2	50	12.9	2, 1	3, 2
3	100	12.9	2, 1	3, 2
1	75	13.9	1, 1	1, 1
2	45	13.9	1, 1	1, 1
3	95	13.9	1, 1	1, 1
1	65	14.9	1, 2, 1, 2	1, 2, 1, 2
2	46	14.9	1, 2, 1, 7	1, 2, 1, 7
3	96	14.9	1, 1, 1, 1, 1, 1, 2	1, 1, 1, 1, 1, 1,

TABLE 2—*continued.*

No. of batch of flies.	Approximate number of flies alive.	Date of feed.	Duration of feed on infected animal in minutes.	Duration of feed on uninfected animal in minutes.
1+2	100	15.9	2, 2	2, 2
3	85	15.9	2, 2	2, 2
4	100	15.9	2	2
5	100	15.9	2	2
1+2	95	16.9	2, 2	2, 2
3	80	16.9	2, 2	2, 2
4	99	16.9	2, 2	2, 2
1+2+3	100	18.9	2, 2	2, 2
4	90	18.9	2, 2	2, 2
5	90	18.9	2, 2	2, 2
1+2+3	90	19.9	2, 2	2, 2
4	85	19.9	2, 2	2, 2
5	85	19.9	2, 2	2, 2
1+2+3	70	20.9	2, 2	2, 2
4	70	20.9	2, 2	2, 2
5	80	20.9	2, 2	2, 2
1+2+3	50	21.9	3	3
4	50	21.9	3	3
5	70	21.9	3	3
1+2+3+4+5	150	22.9	2, 2	2, 2
1+2+3+4+5	150	23.9	2, 2	2, 2

The successive figures in the columns giving the duration of the feed indicate repetitions of the double feed.

ment of a typical reaction. The temperature remained high from the thirty-fourth to the forty-fifth day after the infective dose had been given, and anaplasms were found in the blood.

At the thirty-fifth day the first feeding by *H. pluvialis* was carried out, the flies afterwards being induced to feed on an uninfected animal (No. 549). Daily feedings were continued on these two animals up to the fifty-third day following the original inoculation, at the end of which time No. 549 had been bitten forty-

six times by flies which immediately beforehand had fed on an infected animal at the height of the reaction, when anaplasms were easily demonstrated in the blood. No sign of a reaction appeared, however, in No. 549, although observations were continued for fourteen weeks, and it became evident that transmission had not been effected.

Second Transmission Experiment—using Stomoxys calcitrans.—Animal No. 625 had been infected by the usual dose of 20 c.c. of defibrinated blood injected subcutaneously on August 12th; a typical reaction occurred, and anaplasms appeared in the blood in increasing numbers up to the twenty-sixth day. On this day the first feeding of *S. calcitrans* took place, and daily feeding as described in the method of handling this fly continued up to the forty-third day, in an attempt to infect animal No. 616. Groups of flies varying in number from forty-five up to three hundred were used on each occasion, and at the end of the period the healthy animal had received over 6,000 bites of flies which immediately beforehand had bitten an infected animal at the height of its reaction. Symptoms of anaplasmosis did not, however, develop in No. 616, which remained perfectly healthy.

Control Experiments.

The amount of defibrinated blood used at the laboratory for the routine inoculation of animals for immunisation is never less than 20 c.c., which is greatly in excess of what could be transmitted by flies; and although it is known that anaplasmosis has at times been transmitted by such small amounts of blood as might be carried in a hypodermic needle or on a dehorning saw, it was thought necessary to carry out some tests to ascertain whether similarly small doses were capable of producing infection with the particular strain of anaplasm used in these experiments. If that proved not to be so, it was obvious that the value of the experiments would be nullified in view of the possibility of another and more easily transmissible strain arriving in this country. An animal (No. 590) was therefore inoculated with 20 c.c. of infective blood on 23.10.33, in order that blood might be taken at the height of the reaction for inoculation in graded doses into susceptible animals, for comparison with what had been used in the fly experiments. The temperature reaction occurred at the sixteenth day, and anaplasms appeared in the blood in increasing numbers up to the twenty-fourth day. At the seventeenth day blood was withdrawn from the animal, defibrinated, and injected subcutaneously into five animals in amounts of 0.01 c.c., 0.1 c.c., 1 c.c., 10 c.c. and 20 c.c., with the result that all contracted anaplasmosis, except the one which received the smallest dose.

After this work had been completed it appeared advisable to carry out further inoculations in three instances where attempted transmission had apparently failed, and the two experimental animals, No. 549 and No. 616, which had been subjected to the bite of flies, and animal No. 586, which had received 0.01 c.c. of infective blood, received each a subcutaneous injection of 20 c.c. of infective blood on 30.1.34. As a result of this injection all became affected with anaplas-

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mosis accompanied by the typical temperature reactions and the appearance of *Anaplasma marginale* in the blood, so confirming the failure of the transmission of the parasite by the flies.

Conclusions.

On account of the small number of trials which have been carried out it is clear that no claim can be made to have proved that the biting flies of this country are incapable of transmitting anaplasmosis from one bovine to another. As, however, there is no reason to suppose that the transmission by flies, as demonstrated by the American workers in three species of *Tabanus*, is anything but a mechanical one, and taking into consideration the large number of bites which were inflicted by flies which had every opportunity of transmitting the disease in the experiments here described (46 bites by *Hæmatopota pluvialis* and over 6,000 by *Stomoxys calcitrans*), and that the strain of anaplasm was shown to be sufficiently virulent for 0.1 c.c. of infective blood to transmit the disease, the negative results which have been obtained strongly suggest that the danger of the transmission of anaplasmosis from one animal to another through the agency of biting flies is unlikely to take place under natural conditions in this country.

Acknowledgments.—I should like here to acknowledge the kind assistance rendered by Capt. Bannatyne and Mr. Franklin in carrying out a number of the inoculations and in examining the blood for the presence of anaplasms ; and Mr. Buckhurst's kind assistance with literature on the biting flies.

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PIGEON PARATYPHOID.

By ZAKI MORCOS, F.R.C.V.S., M.V.Sc., D.V.H.
Professor of Bacteriology, Cairo School of Veterinary Medicine.

Introduction.

BRUNETT[1] reported an infection due to an *aertrycke* type of paratyphoid organism which affected 5 to 6 per cent. of a flock of 8,000 pigeons. The affected birds lost the proper use of their wings and developed soft swellings in the neighbourhood of joints containing viscid material from which the bacillus was isolated. Ovarian lesions resembling those of *B. pullorum* in the fowl were also noted, and yielded cultures of the same organism. Biochemical and serological examination showed the bacillus to be closely allied to *B. anatum* (*aertrycke* type). The organism was of low pathogenicity for the fowl. The author suggested, the possibility of egg transmission as in pullorum disease.

Cash and Dean,[2] while studying blood formation in pigeons: seven of the birds became actually ill and developed severe anæmia, and died within a week.

A bacteriological examination was made on four of these birds, and from the blood a Gram-negative organism was isolated and identified as *B. aertrycke*. Inoculation and feeding experiments produced the disease ; birds dying between the ninth and twenty-seventh day, and the organism was recovered from the blood and tissues of the dead birds. Berkefeld W filtrates of twenty-four-hours-old broth culture of the organism had no appreciable effect when fed in 2 c.c. doses to normal pigeons.

Bruno[3] described organisms of the *Paratyphoid B* group in pigeons, canaries and turkeys.

Lesbeuyries and Verge[4] described paratyphoid in pigeons in two forms : the acute, in which the pigeon succumbs rapidly, with lesions of ulcerative enteritis and hepatitis, and the chronic, which is manifested chiefly by arthritis. Organisms isolated were all agglutinated by a serum prepared against *B. aertrycke*. Prophylaxis consists of elimination of reactors by the agglutination test. The authors suggested transmission *via* eggs. Killed cultures had varying results. The authors also drew the attention to the pathogenicity of this group to human beings.

Single[5] described the disease as caused by a bacterium similar to *B. suipestifer*, observed by Moore in New Jersey. The disease is described as associated with marked emaciation, button-like deposit on the crop. Cerebral symptoms predominate, and intestinal symptoms are absent.

White[6] attributed two types of Salmonella in birds, namely, *B. aertrycke* and *B. pullorum*. The course and morbid anatomy in parrots, song birds and pigeons and poultry conform to one pattern. With limply drooping wings and disordered plumage, the bird assumes a dejected appearance, it becomes rapidly emaciated, diarrhœa is usually marked and respiratory trouble common.

Kaupp[7] reported *B. paratyphosis B* as the cause of pigeon paratyphoid.

History, including Symptoms and Post-mortem Findings.

In June and July of 1932, deaths occurred among pigeons in various lofts in Cairo, one at Loubry el-Kebbah, a huge up-to-date loft containing 650 birds, mostly homers ; the owner lost an average of ten birds weekly. Two at Mattaria, each containing fifty birds, homing pigeons ; four dead birds were received from one, and two from the other. At Heliopolis a loft containing sixty pigeons (African owls), eighteen died in the course of two months. At Zeitoun a loft of sixteen Egyptian-bred pigeons were affected, and three died. Birds in the first loft were closely watched, sick birds were found lazy ; a few days later profuse nasal and eye discharges were seen, soon followed by profuse diarrhœa, tail and feet were soiled with watery, greenish fæces. Few cases revealed apparent swellings in the feet and wing-joints, and were seen resting on the breast or the side, and when forced to move they were limping. Marked rapid wasting was a pronounced feature of the disease, in addition to diarrhœa and nasal and eye discharges. Course of the disease was more or less of a chronic nature, average

ten days to two weeks. Post-mortem was made on twenty pigeons with the following constant picture: marked hæmorrhagic ulcerative enteritis and hæmorrhagic peritoneal exudate; abdominal organs were swollen, but chest cavity organs looked more or less normal.

Bacteriological Findings.

Blood films revealed small, non-capsulated, non-sporulating slender Gram-negative bacilli.

Blood Cultures.—On broth, turbidity appeared after twenty-four hours' incubation; on microscopic examination of fresh preparations actively motile bacilli were seen; on staining, slender bacilli, two to four microns long, by 0.3 to 0.4 micron wide, rounded ends, straight rods. On solid media luxuriant non-characteristic growth appeared after forty-eight hours' incubation; growth was non-distinguishable from the coli group. Gelatin was not liquefied. Milk was not changed. Lactose, saccharose and dextrin were not attacked, but glucose, mannite and dulcite were fermented with acid and gas production.

Pathogenicity.—(*a*) Adult fowls (five in number) and sparrows (five in number) were fed with a pipette on twenty-four-hour-old broth culture. Three control pigeons were also fed on the same culture by means of a pipette. Fowls and pigeons each were given 0.5 c.c., and sparrows 0.2 c.c. *Result*: The three control pigeons died within three weeks of feeding, and the organism was recovered from the circulatory system of the dead pigeons, while fowls and sparrows were kept under observation for two months, during which no signs of illness were noticed.

(*b*) Three rabbits, three black-and-white rats, three desert rats, and three control pigeons were inoculated with a twenty-four-hour-old broth culture intramuscularly. Rabbits were given 0.4 c.c. each; rats, 0.2 c.c. each; mice, 0.1 c.c. each; pigeons, 0.3 c.c. each. *Result*: Mice died after twenty-four hours (the three were found dead next morning); rabbits died after three days (three rabbits); rats died on the fifth and sixth day of inoculation; pigeons died, one on the seventh day and the other two on the ninth day. The organism was recovered from all the dead animals and birds.

(*c*) Three guinea-pigs and two control pigeons were each intramuscularly inoculated with 0.4 c.c. twenty-four-hour-old broth culture. *Result*: One guinea-pig died on the ninth day of inoculation, and the two pigeons died on the tenth day of inoculation, and the organism was recovered on seeding the blood of the dead guinea-pig and pigeons, but the two other guinea-pigs developed severe local, painful swelling, which disappeared twelve days after inoculation, and the guinea-pigs soon after resumed normal life.

Pigeons and B. paratyphoid B.—Five pigeons were each pipette-fed on 0.5 c.c. twenty-four-hour-old broth culture of *B. paratyphoid B.* (The strain was kindly given by the Director of the Public Health Laboratories, Cairo.) The pigeons were closely observed for two months, and did not show any apparent

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ill-health. The pigeons were then fed on *B. paratyphoid* of pigeons (isolated from pigeons, and under discussion), each pipette-fed 0.5 c.c. twenty-four-hour-old broth culture; all the five pigeons died within a fortnight of feeding, and the organism was recovered from the blood of the dead birds.

Immunisation.

Vaccine Preparation.—Broth culture, twenty-four hours old, heated at 60° C. for forty minutes, then commercial formalin added in 1 : 1,000 dilution. The vaccine is controlled microscopically and culturally; found sterile and pure; is then ready for use.

Vaccine Testing and Dose Fixing.—Three adult pigeons were inoculated intramuscularly, 1 c.c., 2 c.c., and 3 c.c. successfully, the pigeons receiving 2 c.c. and 3 c.c. developed rather severe reaction, swelling, tenderness and heat; the birds were off food for two days following inoculation. A week later the three pigeons were found in quite a normal condition. The average dose adopted was 0.5 c.c. twenty-four-hour-old broth culture.

Immunity Test.—Six young pigeons about five months old were each intramuscularly inoculated with 0.5 c.c. vaccine seven days later, each 1 c.c. Three weeks following the second dose each was pipette-fed with 0.5 c.c. twenty-four-hour-old living culture, and three control pigeons of the same age as the vaccinated ones were as well fed with the same dose of living culture. *Result:* Control pigeons died within fourteen days of feeding, and the organism was recovered on seeding the blood of the dead birds. Vaccinated birds were kept under observation for six weeks without showing any illness.

Six hundred birds at the Koubbah loft where the outbreak occurred were vaccinated with two successive doses of 0.5 and 1 c.c. respectively. Two months following vaccination twenty birds were pipette fed on 0.5 c.c. twenty-four-hour-old living culture, and three control pigeons were also fed, receiving the same amount as the vaccinated ones. *Result:* The control pigeons died on the twelfth, fourteenth and fifteenth days successively, and the organism was isolated from the blood of the dead birds. The twenty tested birds were kept under observation for two months without showing any illness. On vaccination of the 600 birds, three birds died four days following the first vaccine dose, and the organism was isolated from the dead birds. No other birds died following the second vaccine dose; thus about ½ per cent. loss occurs among birds vaccinated. Since August, 1932, until December, 1934, all the vaccinated birds and their offspring are keeping quite fit.

Summary.

The bacillus paratyphoid of pigeons causes a serious loss in pigeons. Fowls and sparrows resist the infection. Rabbits, rats and mice are susceptible, but guinea-pigs are refractory. Killed cultures are protective in two successive doses.

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ARTIFICIAL INSEMINATION OF THE BITCH.

By K. A. HERMANSSON.

Veterinary Surgeon, Norrkoping, Sweden.

By the phrase "artificial insemination," I wish to express the transmittance artificially of sperma from dog to bitch in order to fertilize the latter. Artificial insemination is not in itself new. According to hearsay the method was used by the Arabs during the fifteenth century. An Arab who wanted a foal out of a valuable stallion belonging to an enemy stole sperma from this stallion by inserting a piece of cotton wool into the sheath of a mare sent for mating to this stallion. After the mating the piece of cotton wool was removed, taken home, and inserted into the sheath of another mare, with the result that she became fertilised. This exceptional experiment was probably forgotten, because we do not hear any more of the method until the beginning of the eighteenth century. The first person who systematically experimented with artificial insemination was Spallanzini. During the eighteenth century he made his first experiments on frogs, silk moths, and later on with dogs. The experiments on bitches seems to have given the best results, because of thirty cases, eighteen became fertilised. In 1897, Haepe mentions seventeen experiments made by Sir Everett Millais on bitches, but does not mention either method or results. In 1902, Sand and Stribolt worked out a method whereby they obtained sperma from stallions to be used on mares. Hoffman, in Stuttgart, has worked after the same principles, and published his results during 1905, 1907 and 1908. Even on women artificial insemination has been applied. A case that created a sensation was performed by Doderlein in 1912. Rohleder mentions no less than twenty-one such cases that gave results.

The biggest and most important experiments with artificial insemination, however, have been made by the Russian, Ivanoff, who as early as 1912, had made no less than 800 artificial inseminations on mares, and even made experiments on cattle, sheep and goats. Literature does not state if he made experiments on dogs or not. In ordinary circumstances there is no need to use artificial insemination on dogs. In some cases, however, a mating cannot take place on account

of one of the parties not being interested in the act. In other cases anatomical reasons can make a normal mating impossible. Even diseases such as ejaculatio precox can make a normal mating impossible. In such cases there is usually no other way of getting puppies from a certain dog or bitch except by applying the artificial method. It is therefore surprising that the method is not used more often. The reason for this may possibly be that the method used on horses is not applicable on dogs. In cases where the stud dog has been willing to mate it has usually been quite easy to get sufficient sperma simply by placing a bowl under the dog after the ejaculation has started. The greater difficulty has been to get sperma from studs who have shown no interest in the bitch. Such cases have been successful after giving the stud an injection of yohimbin and massaging the penis, in this way getting an ejaculation of sperma. An ordinary bowl has been used to take the sperma, and the injection in the sheath of the bitch made with an ordinary 10 c.c. hypodermic syringe on which a soft rubber spout has been put. All instruments have been boiled in a physiological solution of chloric salt, and heated to body temperature. As artificial insemination of bitches is not very usual; I give below a few of my own cases where a normal mating has not been possible.

Case 1.—Reason for artificial insemination: An unusually small maiden dachshund bitch was to be mated to a stud dog whose erection was so sudden that the penis could not be put into the sheath of the bitch before the erection had reached its height, and ejaculation had started. To insert the penis afterwards was impossible. The case compares with ejaculatio precox in humans. Mating was tried 25.3 and 27.3.1932. The bitch was willing, but on account of what previously has been mentioned, a mating was not possible. Artificial insemination was made on 27.3 and 28.3.1931. After light massage of penis 10 c.c. of sperma was taken both days, and was injected as far as possible into the sheath of the bitch. The result was six well-developed puppies, born without difficulty 31.5.31.

Case 2.—After the success of the first case it did not take long before the method was given another trial. Even this time it was a maiden dachshund bitch, and the same stud dog as mentioned in Case 1. After the stud dog, on 12.12 and 13.12.1931, repeatedly had tried to mate the bitch, he did not show any more interest in her. Artificial insemination was made on 13.12.1931 and 14.12.1931. Light massage of penis resulted in 8 c.c. of sperma, which was injected as far as possible into the sheath of the bitch. On 14.2.1932, the bitch whelped two puppies, one of which died in birth, the other was reared and has won many prizes at shows.

Case 3 was with the same stud dog as mentioned in my two previous cases, and a two-year-old maiden dachshund bitch. In this case the bitch was willing but not the stud. Artificial insemination was made on 12.2.1932 and 15.2.1932. It was impossible to get erection by massage of penis, and therefore 0.004 gr. chlor. yohimbin was injected hypodermically. Twenty to twenty-five minutes after the injection, massage of penis was repeated with resultant strong erection, and an ejaculation of 30 c.c. of sperma was obtained, which was injected as

far as possible into the sheath of the bitch. The result was one puppy, which died soon after birth.

Case 4.—Year-and-a-half-old maiden wire fox-terrier bitch, who showed every sign of heat, but bit the dog off as soon as he came near her. The dog had never mated before, and showed very little interest in the bitch. On the twelfth and thirteenth day of heat, 23.12.1932 and 24.12.1932, artificial insemination was made. After massage of penis no erection resulted, therefore 0.004 gr. chlor. yohimbin was injected hypodermically. Fifteen minutes after the injection a strong erection set in, and the resultant ejaculation gave 4 c.c. sperma, which was injected as far as possible into the sheath of the bitch. On the following day, 24.12.1932, the attempt was repeated, and this time the erection and ejaculation was obtained without use of yohimbin. On 23.2.1933, three well-developed puppies were born, two dogs and one bitch.

Case 5.—My last case was a nine-months-old maiden Scottish terrier bitch. The bitch showed every sign of heat, but a normal mating was impossible. On examination it was found that the bitch was too narrow in the sheath, and a normal mating was therefore impossible. Artificial insemination was made 17.5.1934, and the result was one puppy, born on 19.7.1934. Unfortunately the puppy came backwards and died in birth.

I have tried two more cases, but as both of these have given negative results, I do not think it necessary to go into the details of same. By the above I have wanted to show the possibilities of obtaining puppies from suitable breeds in cases where a normal mating has been found impossible, either on account of anatomical reasons or illness, even in cases where personal aversion seems to be the reason.

A NEW MODEL OF EYEGLASSES FOR HORSES.

By EUGEN WAJGIEL, Dr. Med. Vet.

Director of the Veterinary Surgical Clinic of the University of Warsaw.

THE now existing model of glasses for horses cannot be strictly considered as eyeglasses in the full meaning of the word; they serve rather, as shows the name given in the catalogues, to protect the eyes, but not to correct refraction. Besides, even as eye protectors they possess a fault, as the glass is adjusted in a rim lying too near the lids, the eyelashes therefore touch the glass and cause the inside surface to become dirty. In this way the glasses become dimmed very shortly after being put on. It must be added that the glasses are fixed firmly in their rim and cannot be changed. The application and common use of eyeglasses for horses, if spread, would be sure to give undoubted advantages. It has been proved by many writers already at the end of last century that there is a dependence between the horse's sight and his behaviour or productiveness. For instance, it has been noticed that short-sighted horses were afraid and rather unwilling to take greater obstacles. It has also been marked lately that short-sighted horses shake the

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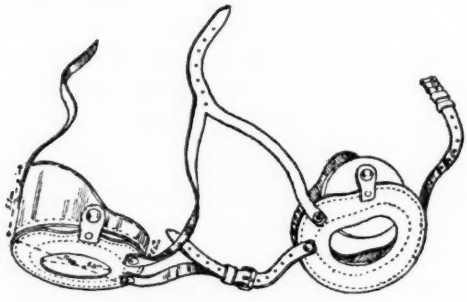
rider more than those with normal sight—that there is a dependence between the horse's gait and his sight, and that short-sighted horses often suffer leg illness, as with bad sight comes a change in gait, and this has a negative effect on muscles, sinews and the joints of legs.



Horses' eyeglasses of my modification serve to correct defective refraction of the eyes. They are therefore designed for the same purpose as people's eyeglasses. At the same time they may be used as eye protectors.

The rim has side flaps of stiff leather, one at the nose, the other at the temple side. They are of a width which keeps the glasses securely out of touch of the eyelashes. The glasses can be adjusted and taken out through an opening in the rim; they may be suitably selected or changed while the rim remains the same, which is of importance, especially in experimental tests. The size of the glasses and rim given on the sketch are for horses of a medium-sized head. The length of the straps holding the eyeglasses in place is changeable, and may be regulated by buckles to fit a head of any size.

EVOLUTION OF THE NASAL CAVITIES AND SINUSES IN RELATION TO FUNCTION.*

By J. F. O'MALLEY, F.R.C.S.

The Nasal Cavities.—Prior to the advent of modern rhinology, anatomists and physiologists in their study of the structure and function of the nose seemed to regard the latter as being exclusively concerned with the sense of smell. In civilised man other functions are much more important, and in his case the olfactory anatomy and its associated sense have retrogressed, when compared with that of many of the lower animals.

If we look at the comparative anatomy of the olfactory organ in the vertebrate group, or craniata, beginning with the lamprey, and trace its evolution through

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the fishes, amphibia, reptiles, birds and lower mammals to man, we find many interesting phases of progression and regression. First, it is apparently an organ of smell only, then related to taste and assimilation, and later to respiration; and as this predominates, the more primitive function of olfaction recedes. The specialised structure of the adult of a lower class becomes vestigial in the adult of a higher class, but in the developing embryo of the latter it is always reproduced to be repressed later. Before the formation of the permanent palate establishes the nose of the mammalian types, the human fœtus goes through the phases which we find in the lamprey, dog-fish, amphibia, reptiles and birds. At this stage, and even later, we see also characteristics which belong to the adult among lower mammals. As we ascend in the scale from water to air breathers, the phylogenetic variations of the nose are intimately related to the evolution of the face and mouth. As Keith puts it, there are three distinct stages reproduced in the development of the human embryo. (1) A piscine, in which nose and mouth are formed independently; (2) an amphibian stage, where the nasal respiratory passage opens on the roof of the mouth; and (3) a mammalian stage, in which it opens into the nasopharynx.

Cyclostomata.—The lower vertebrates, such as the cyclostomes, which include the lamprey and mud-eels and elasmobranchs, of which the dog-fish is a well-known representative, possess first a membranous brain-case which chondrifies later, both in the base and the calvarium. All higher vertebrates, in embryonic life, possess first a membranous brain covering, which chondrifies in the base only, and ossifies directly into bone in the calvarium, owing to the rapid growth of the cerebral vesicles. This is especially exemplified in man.

The growth of the cartilaginous case under the fore-brain surrounds a circumscribed patch of ectodermal cells, which is destined to become the olfactory organ, and this particular portion of cartilage is referred to as the " olfactory capsule " and is the precursor of the nose. The group of cells now receded from the surface for protection is called the olfactory pit or sac, and the opening on the surface the anterior naris.

In the lamprey there is only one external nostril—on the dorsal aspect of the head; the olfactory sac is large and divided in two by a septum, but does not communicate with the mouth. This is the first trace of a nasal septum. The nose of the human embryo at the fifth week is comparable to that of the lamprey, but has two pits. Mud-eels, which belong to the same class as the lamprey, have an opening from the olfactory sac into the pharynx, where taste buds are present. The dog-fish has two pits or external nares communicating with the mouth by grooves. The linings of the pits are raised in folds to increase the sensory area, a mechanism which is possibly the forerunner of the turbinate bone.

On one side of each naris a fold is present to enable water to flow quickly through the pit. This is the earliest trace of a mechanism for drawing air over a sensory surface, according to Kingsley, who further states that before the skeletal parts are formed these grooves are present in lung fishes amphibia and amniotes.

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The function of the nose of the dog-fish is olfactory, respiratory and assimilative. The nose of the human embryo at the sixth week has reached the same stage as that of the adult dog-fish.

In all other fishes (except lung fishes), there are two anterior nares (the salmon has two on each side), the sensory epithelium is at the bottom of a pit and does not communicate with the mouth. This is the condition of the human embryo at six and a-half weeks. The mesial and lateral nasal processes have joined around the pits and across the grooves, but the bottom of the pit is still shut off from the mouth by the bucco-nasal membranes. These disappear about the seventh week, leaving the condition which is present in lung fishes. The latter are peculiar in having no premaxilla, maxilla or nasal bones, and the anterior nares are on the ventral side of the snout, within the upper lip; in all higher vertebrates a premaxilla is present which carries the external nares forwards on to the face. This is the earliest instance of a paired cavity nose which is used for smell and respiration.

Amphibia.—The Amphibia have two external and two internal nares, the latter opening into the mouth lateral to the vomer, and just inside the jaw. A cartilaginous septum separates the two nasal cavities, each of which contains an olfactory sac. On each side of the septum, near the posterior nares, a portion of the sensory epithelium is differentiated to form the organ of Jacobson, and owing to its situation near the internal nostril it is regarded as a taste organ. It is supplied by the first and fifth nerves. This is the first trace seen of this special division of the olfactory sensory epithelium. The ventral portion of each nasal cavity contains ordinary epithelium and is respiratory, and the dorsal has special sensory epithelium and is olfactory.

Amphibians of the Urodele order, which includes salamanders and newts, have a projection from the lateral wall of the nasal cavity, this being the earliest manifestation of a real turbinate bone. The frog, in breathing, closes the mouth and depresses its floor, and draws air through its nostrils into the buccal cavity. The floor of the mouth is then raised and the nostrils, which are valvular, are closed, and air passes through the glottis. A frog would die of asphyxiation if its mouth was kept forcibly open. At the eighth week the human fœtus has the same primitive arrangement of the anterior and posterior nares and palate as we find in amphibians.

Reptiles.—The lower reptiles such as lizards and snakes present an olfactory and respiratory organ almost identical to that just described in the amphibians. They have two anterior nares, two slit-like choanæ on each side of the vomer, *i.e.*, two nasal cavities with a septum between. The septum is inter-orbital in lizards and the higher reptiles such as turtles and crocodiles, but not so in snakes. The nasal cavities of reptiles consist of an outer and inner compartment. The character of the lining epithelium suggests that the former is respiratory, and the latter olfactory. The inner chamber contains a raised scroll or turbinate, and a pseudo-turbinate on the outer wall, the function of which is to increase the area of sensory surface. In the crocodile the nasal cavity extends to the very back

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of the mouth ; the glottis can be brought into direct contact with the posterior nares, thus enabling the animal to carry on direct respiration, even when the mouth is submerged in the act of drowning its prey.

Jacobson's organ is a detached portion of olfactory plate and epithelium situated in a scroll of cartilage on the anterior part of the nasal septum near the nasopalatine foramina. It is first seen in amphibia (urodeles, tail-retaining amphibians), is well developed in lizards and snakes (lower reptiles), and absent in higher reptiles (turtles and crocodiles), except in embryonic life.

The organ is never developed in birds, but traces are seen in the embryo. Amongst mammals it attains its highest development in Herbivora, when the juices and odours from the mouth have access to it through the wide open nasopalatine foramina, and Broman suggests that its function, like the olfactory organ of fishes, is to sample dissolved substances. In man, about the fifth week of embryonic life the lower portion of the olfactory epithelium can be seen separating off to form this organ, which attains its greatest relative size at the fifth month ; It is present at birth as a pocket on the septum, opposite the anterior palatine foramina, but becomes vestigial in the adult. It is an interesting speculation whether those persons who are gifted with a keen sense of appreciation of the presence of aromatic and ethereal substances in solution do not possess a considerable rudiment of Jacobson's organ.

Birds.—The birds have two anterior and two posterior nares, and two nasal chambers. The latter are separated by an interorbital septum and bounded externally by the ectoethmoid, which presents three scrolls of turbinates, poorly developed, and named respectively anterior, middle and posterior. Birds have a very limited sense of smell. It is notable that even birds of prey hunt their quarry by sight and not by smell. The anterior turbinate lacks olfactory epithelium, which disappears from the middle after hatching, and is only found on the posterior in the adult, this being the sole seat of smell. As already pointed out, Jacobson's organ is never developed in the adult, but traces are seen in the embryo. The nose in birds is mainly respiratory.

Mammals.—The mammals have two anterior and two posterior nares. The nose does not communicate with the mouth, as the formation of its floor by the permanent palate carries the posterior nares into the nasopharynx.

In animals such as the herbivora, which have large open nasopalatine foramina, the juices in the mouth may pass up into contact with Jacobson's organ, but are not free in the respiratory passage. The nasal cavities are paired chambers, separated by an inter-orbital septum and bounded on the outer wall by scrolls of bone or turbinates, which vary in number from six in the chimpanzee to three in man. Three is the usual number in mammals, but in animals with a keen sense of smell, as in the chimpanzee, there are as many as six.

Keith advances the view that turbinates and meatuses, though they increase the olfactory area, are developed in connection with respiration in order to

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filter and warm inspired air. Certain physiological and anatomical data both support and negative this view, yet in the main it must be regarded as correct.

It is a noteworthy fact that we find the largest number of turbinates in those air-breathing animals with a keen sense of smell, yet the relative distribution of olfactory and respiratory epithelium shows that the latter predominates. In amphibia and reptiles the turbinates are situated in the olfactory portion of the nasal chamber only and are covered by true sensory epithelium, yet the sense of smell is poorly developed in most of them. The shark, with no turbinates, has an extremely keen sense of smell, by which he lives. The olfactory nerves of a shark twenty-five feet long would spread over an area twelve to thirteen square feet. Birds have poorly developed turbinates and a very limited sense of smell.

The horse, a pure nose breather (it cannot breathe through the mouth owing to the soft palate being five or six inches long), has three very elaborately scrolled turbinates, which are manifestly designed for respiration ; but it has also a keen sense of smell.

In the human fœtus, at the fourth month, there are six turbinates. In the adult, the first persists as the maxillary or inferior turbinate, the second as the middle, the third and fourth unite to form the superior, the fifth disappears, and the sixth forms the sphenoidal turbinate. The agger nasi corresponds to the naso-turbinates of carnivora and keen-scented animals.

There is evident retrogression in the number, from six in the fœtus to three in the adult, and running parallel with this limitation in the turbinates is a corresponding reduction in the area of the sensory epithelium. The latter descends in the fœtus on the outer wall to the lower border of the middle turbinate and on the septum to the junction of the upper two-thirds with the lower third, whereas in the adult it covers less than half this area.

The replacement of sensory by respiratory epithelium is one of the great responses to functional needs which the nose has undergone in the process of evolution from a purely olfactory to a largely respiratory organ.

In the adult whale the epiglottis is intranarial, ensuring direct passage of air to the glottis, and the same arrangement is present in the human fœtus up to the fifth month. In many mammals the epiglottis is in the nasopharynx in contact with the palate, but in man it is withdrawn to make provision for the function of speech. Man may be considered to have lost control in some degree over the respiratory function of the nose, in addition to being exposed to the risks of mouth-breathing, in order to acquire this facility for speech. A new addition to the structures of the nose, which we must look upon as purely respiratory, is its erectile tissue. It is distributed on the inferior turbinate (lower border and posteriorly), on the free anterior and lower border of the middle turbinate, and the posterior border of the septum.

Wright and Smith regard it as being closely related to the beginning of sexual life and the advent of adolescence, though not sexual in function.

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It is fully developed after adolescence and atrophies in old age. Though common to all warm-blooded animals, it attains its widest nasal distribution and greatest development in man, which Wright attributes to his clothing, the warmth of his dwellings and his general artificial environment.

It acts as a kind of central heating mechanism or warming pan for the nose, over which the cilia wave in a layer of warm moisture, causing the entering air to become saturated, as a result of which we get the pleasant sensation of nasal evaporation.

The Nasal Accessory Sinuses.—These cavities have no representation in the animal kingdom below reptiles.

Veterinary anatomists use the term " facial sinuses " instead of the nomenclature which we employ. This is technically correct from the developmental point of view, but ours is, I think, more appropriate physiologically. As already pointed out, the primitive membranous covering of the embryonic brain in mammalia undergoes chondrification, before ossification, in the basal portion of the skull, but ossifies directly from membrane in the calvarium. The face is developed from this basal portion, the real core of which is the olfactory cartilaginous capsule. Bones preformed in cartilage are slower in growth and later to ossify than those laid down in membrane, and they have the further peculiarity of forming large air spaces, which, on the hollow girder principle, give the necessary bulk and strength to the framework of the face, without adding to its weight.

This would seem to be the primary reason of their existence, but that they have further function there is no reason to doubt. In embryonic life their formation seems to be always preceded by, or associated with, a definite budding out of the mucous membrane lining the lateral walls of the nose, which keeps pace with the cavitation, yet retains continuity with the nasal cavities, and possesses the same type of respiratory epithelium. This would lead us to infer that they are intended to participate to some extent in respiration also. In the horse they empty during inspiration and fill on expiration, which is contrary to what one would expect. Paulsen's experiments show that inspiration causes a negative and expiration a positive pressure in the nose and antrum in man, which indicates that the respiratory interchanges of air in the sinuses are similar to those found in the horse.

By this arrangement cold air never enters the cavities, but that they play more than the passive rôle of warm air reservoirs is certain. The presence in the cavities of ciliated epithelium, whose chief function in the respiratory passage is to establish a waving sheet of moisture to facilitate the easier absorption of it by the passing air, may mean that they are intended to complete the saturation of the already warmed air. They are further concerned with the growth of the teeth. The size and development of the maxillary sinuses have an intimate relationship of this nature.

Amongst domesticated animals we find small antra in the pig and dog, and the absence of dental roots in the floor. The converse is true of the ox and horse,

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which have large sinuses, with teeth roots covered by a layer of bone in the floor. Both types occur in man, and the growth backwards of the antra controls the descent of the permanent double teeth.

The frontal sinuses are vast excavations in the pig and are also large in the ox and horse. They do not communicate with the maxillaries in the pig and dog, but do so by a very large opening in the horse. This fronto-maxillary passage is common in the gorilla and occasional in man.

The frontal sinus bud is present at birth in the ethmoid region and lies undeveloped until after the fifth year, when it rapidly takes on growth. Keith suggests that the purpose of this is to widen the skull base for the support of the large palate to carry the more numerous permanent teeth. Perhaps the most important function which the air sinuses have in man is that of resonating chambers in relation to speech.

By the bulging forward of the cranial roof and the downward inclination of the face, the sinuses are brought in front of the sound-producing mechanism in the larynx, and the maximum result is thus obtained.

USE OF THE STOMACH TUBE IN DOG AND CAT PRACTICE.

By J. GILBERT HORNING.

Houston, Texas.

Lavage.

LAVAGE means washing out the stomach by copious injections and rejections of fluid with the aid of the stomach tube.

Expression is the form where copious injections are made, the tube pulled into the mouth and started back, and then out and back a few times, trying to produce a desire to vomit in the patient; if this does not work, withdrawal of the tube at once, pulling out the tongue and exerting pressure with the index finger on the base of the tongue, at the same time having the assistant press with hands on both sides of the abdomen, inwards and forward. Failing to start vomiting by this means, aspiration is the next choice. One should always compress the tube when withdrawing, and withdraw quickly, as liquid might be retained in the tube; if withdrawn slowly without compressing the tube, there might be an escape of fluid into the larynx, probably causing choking, coughing or vomiting.

Aspiration is the form of procedure where the aspirating apparatus depends upon the case and choice of the operator: either a tube with a two-way bulb and funnel, or a tube and syringe. Copious injections are made, and in the case of tube with funnel and hand bulb the funnel is lowered as the last injection of fluid is made, and the hand bulb rapidly pumped to start

the flow outward. In the syringe with tube, after the injections, the syringe bulb is pressed in, the syringe attached to the tube, and the suction of the syringe bulb started and the tube lowered at the same time to create the flow of fluid outward; when started the syringe can be removed and the contents syphoned into a pan; should a specimen be desired the syringe can be filled and then emptied into a container for further examination, or the entire fluid can be emptied into a special container for examination.

In dog practice lavage is used less than gavage; however, when needed it is of great help. Due to the fact that out canine patients swallow such large pieces of foodstuff, withdrawing this through the tube would be absolutely impossible. The use of emetics (apomorphine hydrochloride, preferably) is far more satisfactory; cases where emetics are contraindicated, lavage by expression can be tried, and if this fails, by aspiration. In extremely weakened cases of distemper in the second stage, where the animal swallows a lot of nasal discharge and mucus, washing the stomach with a 1 per cent. bicarbonate of soda solution is of decided help. Hæmorrhage of the stomach or duodenum, washing with ice water to which adrenaline solution has been added, will give beneficial results in certain cases.

In strychnine poisoning cases, a dose of pentobarbital sodium can be given hypodermically, and after the dog relaxes the stomach tube can be administered and a teaspoonful of tannic acid dissolved in six ounces of water given by tube. In acute vomiting cases one washing daily with boiled water that has been allowed to cool carried out for four or five days, accompanied by feeding suitable to the digestive capacity, will give splendid results; should unsuitable feedings be continued the lavage will be of little benefit. In washing the stomach a copious injection should be made, syphoned off, or rejected by the natural vomiting act, again making an injection until the rejected fluid is clear; should the condition of the patient not warrant this procedure, several injections and rejections will do.

Cases of indifferent appetite and limited food capacity without vomiting are greatly benefited with this treatment. In this class stomach washing once a day will be followed by a surprising improvement, showing that there may be stomach disorders of considerable importance without vomiting, the only symptom being loss of appetite and malnutrition. Atony of the stomach or gastric atony may be a functional gastric disorder, or, if severe, show symptoms attributable to the motor insufficiency of the organ itself. The symptoms usually noticed are distress following the taking of food, later vomiting, which may be occasional or after eating. Lavage gives these cases relief for a variable period.

Wherever stasis or food residue occurs, lavage given at night for several nights is of great value. In some of these cases there is a large quantity of vomitus of decomposing food: nightly lavage, with rest of the stomach for twelve or more hours, in some cases twenty-four to forty-eight hours' rest; the only thing they are allowed to drink is a small amount of boiled water that has been allowed to cool;

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this given at regular intervals, and the amount depending upon its reception by the stomach and the size of the patient. After the rest, foods suitable to the condition of the patient is the only treatment needed. Should a laxative be needed, orange juice and milk of magnesia, equal parts, administered by tube in the morning, gives the best results.

The question has been raised as to the contraindications of the passage of the stomach tube. Matters of this nature depend upon the judgment of the operator; personally, I know of no case where the passage of the tube would be contra-indicated. Cases that were extremely weak would not practise a drastic, but only use a mild lavage, and several hours later gavage should be of possible benefit. The skill of the operator naturally depends upon his judgment gained through study and experience.

Gavage.

Gavage.—Feeding and medication by the stomach tube. The technique for passage of the tube is the same as lavage: moisten the tube with water, pass it, and after administering whatever is to be given, the tube should be compressed and quickly withdrawn. Patients that cannot retain a teaspoonful of water administered by mouth will retain half an ounce or more by tube. Gavage can be given every four hours; in feeding, at first use half the quantity given in health, gradually increasing as the patient's condition justified. Gavage, from the fact that it can be used to feed and medicate the patients, is naturally used in our work more than lavage. Liquid medicines that the animal ordinarily would fight if administered by mouth can be given with ease by tube. Other solutions that from their volume, when given by mouth, become a tiresome and sloppy procedure, when administered by tube are given with neatness and dispatch. Some dogs will start slobbering any liquids, so much so that it is almost impossible to get the medicine down, and then only a small amount, the dogs during this time soiling their foreparts; cases of this type can be corrected by giving the tube at once and administering the medicine.

In severe cases, such as pneumonia, grave gastro-intestinal conditions, etc., gavage may save the life of the patient. In nearly all these cases where insufficient nourishment is taken to support life, gavage may be employed every four or five hours, at least three times a day for several days, until the patient becomes strong enough to desire to eat voluntarily.

Foods to be Administered by the Stomach Tube.

This varies, depending upon the case and animal, the cat requiring different foods than the dog. For dogs: *Sweet milk and Karo syrup mixture.* Pasteurised sweet milk and white Karo syrup, in the proportions of one part of white Karo syrup to ten parts of milk, is one of the best food combinations. Depending upon the case, the milk is either given cold, warm, scalded or boiled.

Dr. Carl F. Schlotthauer, of the Mayo Foundation, Rochester, Minn., aptly

stated the qualifications of this mixture in his letter to me some time ago " We use the stomach tube to feed milk and Karo syrup to all sick and debilitated dogs that refuse to drink of their own accord ; we feed the milk and syrup mixture to many dogs that have bowel operations. It is our old reliable stand-by to build up any dog that loses flesh."

As an alternate feed :

Nutritive Liquid Peptone Mixture.—Nutritive liquid peptone, one part, distilled water, three or four parts ; when feeding this we keep a small bottle of peptone and a bottle of distilled water in the refrigerator, mix at the time it is administered. This can be used as an alternate feed once a day, or in cases not receptive to milk in any form or manner it can be given as often as three times a day. Some cases require a slightly greater dilution than stated.

Farina Mixture.—Farina is another alternate for the milk and Karo mixture. To two cups of hot milk add one-quarter of a cup of farina cereal, stir and cook for five minutes, strain through a sack, and add sufficient scalded sweet milk necessary to make into pouring solution.

Corn Starch Mixture.—To a cup of scalded or boiled sweet milk that has been allowed to cool, mix Argo corn starch, as much as desired, usually one to two tablespoonfuls, stir and pour into tube warm.

For Nursing Pups and Kittens :

Carnation Milk Mixture.—Carnation milk, one part ; boiled water, three parts ; white Karo syrup, one part to ten of the mixture. As the pups and kittens become older, the amount of water can be decreased until they are being given one part Carnation milk and two parts water at lapping time. Pups and kittens can be fed easier and faster with the tube than with a bottle. They take the tube readily.

For Cats :

Carnation Milk Mixture.—Carnation milk, one part ; water, two parts and gradually decreasing to equal parts, and in some cases giving the Carnation milk straight from the can. This mixture is for large kittens and grown cats.

Peptonised Milk (Cold Process Method).—Put half a teacupful (¼ gill) of cold water and half the powder contained in a peptonising tube (Fairchild) into a clean pint milk-bottle and shake thoroughly ; add half a pint of cold, fresh milk and shake again and place the bottle immediately on ice—directly in contact with ice. Always shake the bottle well before and after pouring out a portion. In making this, always use Fairchild Bros. and Foster's peptonising tubes. Feed the peptonised milk to cats by the tube two or three times a day, one to two ounces at a feeding for grown cats and less for the young, and in a few days they will want to eat voluntarily.

The above mixtures described are sufficient to get along with, they are tried and proven, not elaborate or costly, and easily prepared. The proportions given in all formulas can be changed to suit the amount needed.

MILK ACT, 1934.
MINISTRY OF AGRICULTURE AND FISHERIES.
Particulars of Arrangements for the purpose of Section 9.

(ENGLAND AND WALES.)

THE arrangements made by the Minister of Agriculture and Fisheries, and approved by the Treasury, for the purpose of Section 9 of the Milk Act, 1934, are indicated in the annexed documents, numbered as under :—

(1) *Explanatory Memorandum* on the Tuberculosis (Attested Herds) Scheme (England and Wales).

This Memorandum describes the facilities provided in England and Wales for the official certification of cattle herds free from tuberculosis, and the steps to be taken by the owners of such herds in order to obtain an official Certificate of Attestation from the Ministry of Agriculture and Fisheries entitling the herd to be added to the official Register of Attested Herds, and to the other benefits of such registration.

(2) The *Rules* required to be observed in the case of herds in respect of which a Certificate of Attestation has been issued by the Ministry of Agriculture and Fisheries under the above-mentioned Scheme.

These arrangements will come into operation in England and Wales on February 1st, 1935, which is the day appointed by the Minister of Agriculture and Fisheries and the Secretary of State for Scotland for the beginning of the period of four consecutive years referred to in Section 9 of the above-mentioned Act.

Ministry of Agriculture and Fisheries,
Whitehall Place, London, S.W.1.
January, 1935.

DOCUMENT (1).

Explanatory Memorandum on the Tuberculosis (Attested Herds) Scheme for England and Wales.

OFFICIAL CERTIFICATION OF CATTLE HERDS FREE FROM TUBERCULOSIS.

(1) *Herds eligible for Official Test and Conditions of Certification.*—The Ministry is prepared to undertake the testing with tuberculin of herds of cattle of any registered producer in England and Wales as explained below, and if no reactors are found, to issue Certificates of Attestation in respect of the individual herds, subject to the observance of certain Rules by the owners of the herds. In every instance all the cattle (including calves) comprised in the herd will be submitted to the test. The procedure will be as indicated in the following paragraphs. The term " registered producer " means a producer registered under the Milk Marketing Scheme.

(2) An owner who has taken steps to eradicate the disease from his herd is entitled to make an application to the Ministry for an official test provided that

no reactors were found in the herd on the occasion of the last two tests if carried out with an interval of not less than six and not more than twelve months between the tests and if the last of these two tests was carried out not more than twelve months before the date of application. The application should be supported with certificates to this effect signed by the veterinary surgeon who carried out the tests on behalf of the owner. The official test will not be carried out earlier than a minimum of sixty days from the date of the second of the two above-mentioned tests applied by the owner's veterinary surgeon.

(3) *Date of Commencement and Period of Validity of Certificate of Attestation.*—A Certificate of Attestation will be valid as from the date of application or from the date of commencement of the Scheme or from the date of expiration of a period of 60 days from the date of the last test applied on behalf of the owner, whichever of these three dates is the latest. A certificate will be valid for one year.

(4) *Renewal of Certificate.*—A Certificate of Attestation will be renewed annually, if desired by the owner of the herd, after a further official test of all cattle in the herd provided that no reactors are disclosed, and the Ministry is satisfied that the herd, and the premises on which it is located, continue to be suitable for attestation. If reactors are found, the renewal of the Certificate of Attestation will be suspended, and the following restrictions and requirements will operate, but the herd will not be removed from the Register mentioned in paragraph 7 of this memorandum unless and until the Certificate is cancelled under the provisions of (*e*) below.

(*a*) The reactors will be immediately isolated and disposed of by the owner as quickly as possible and the premises thereafter disinfected. During the period of suspension non-reactors from the herd will not be permitted unrestricted entry into another attested herd.

(*b*) The non-reactors must be submitted to further official testing, such tests to take place not earlier than 60 days from the date of completion of the completion of the disinfection of the premises.

(*c*) If no reactor is revealed as the result of such retest, the Certificate of Attestation will be renewed for a further period of six months.

(*d*) If any reactor is revealed as the result of the retest, it must be immediately removed from the herd and the premises again disinfected. A second official retest will then be carried out at the expiration of 60 days from the date of completion of the last disinfection of the premises.

(*e*) If any additional reactor is found as the result of the second retest, the herd will be removed from the Register of Attested Herds and the Certificate of Attestation will be cancelled; and no further official test will be made until the conditions laid down in paragraph 2 of this memorandum are complied with, when the question of reinstatement will be considered.

(*f*) If no reactor is found as the result of the second retest, the Certificate of Attestation will be renewed for a further period of six months.

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(*g*) During the period of suspension of the renewal of the Certificate of Attestation the Rules applicable to Attested Herds will continue to operate unless and until the Certificate is cancelled in the manner indicated in (*e*) above.

(5) *Cost of Tests.*—Tuberculin testing by or on behalf of the Ministry will be limited to the official tests referred to in this memorandum, and will be carried out without charge to the owner. These official tests will exclude the preliminary tests applied on behalf of the owner preceding his application to the Ministry as described in paragraph 2 of this memorandum.

(6) No claim will be entertained against the Minister in respect of any loss occasioned by the death, injury, or illness, however caused, of an animal submitted to any tests by or on behalf of the Minister.

(7) *A Register of Attested Herds* comprising particulars of herds in respect of which a Certificate of Attestation has been issued by the Ministry of Agriculture and Fisheries will be kept by the Ministry and published from time to time.

(8) *Bonus.*—There will be paid to the owners of herds appearing on the Register, a bonus of one penny per gallon for all milk sold from such herds under the provisions of the marketing scheme of the Milk Marketing Board as from the date on which the Certificate of Attestation is valid, subject to the observance by the owners of such herds of the Rules applicable to Attested Herds.

(9) Forms of Application for a Certificate of Attestation under this scheme may be obtained from the Secretary, Ministry of Agriculture and Fisheries, Whitehall Place, London, S.W.1.

Ministry of Agriculture and Fisheries.
January, 1935.

DOCUMENT (2).

Rules Required to be Observed in the Case of Herds Certified by the Minister of Agriculture and Fisheries under the Tuberculosis (Attested Herds) Scheme (England and Wales).

(1) *Admission to Official Register of Attested Herds.*—The owner of a herd proposed for admission to the Register of Attested Herds kept by the Ministry of Agriculture and Fisheries will be required :

(*a*) to satisfy the Ministry that he is a "registered producer," *i.e.*, a producer registered under the Milk Marketing Scheme ;

(*b*) to satisfy the Ministry that the management of the herd and the conditions in which it is kept are suitable for the observance of these Rules ;

(*c*) to produce the following evidence of the freedom of the herd from tuberculosis, namely, certificates signed by a veterinary surgeon to the effect that the herd has been tested with tuberculin on two occasions with an interval of not less than 6 and not more than 12 months between the tests—the last of the two tests being carried out not more than 12 months before the date

of application to the Ministry for attestation—and that no reactors were found as the result of either of these two tests;

(*d*) to give a written undertaking that he will to the best of his ability abide by and observe these Rules and any amendment or addition thereto which may be made by the Minister.

If these requirements are satisfactorily met an official test of all animals in the herd will be made by the Ministry free of charge with a view to the herd being added to the register of Attested Herds and the issue by the Ministry of a Certificate of Attestation if no reactors are found.

(2) *Issue of Certificates of Attestation.*—The Ministry will issue to the owner of a herd added to the Register of Attested Herds a Certificate of Attestation, and the herd will be known as an " Attested Herd."

(3) A Certificate of Attestation is valid for one year. It will be renewed annually, if desired by the owner of the herd, after a further official test of all cattle in the herd provided that no reactors are disclosed, and the Ministry is satisfied that the herd, and the premises on which it is located, continue to be suitable for attestation. If any reactor is found, the renewal of the Certificate of Attestation will be suspended and the following restrictions and requirements will operate:

(*a*) The reactors must be immediately isolated and disposed of by the owner as quickly as possible and the premises thereafter disinfected. During the period of suspension non-reactors from the herd will not be permitted unrestricted entry into another Attested Herd.

(*b*) The non-reactors must be submitted to further official testing, such tests to take place not earlier than 60 days from the date of completion of the disinfection of the premises.

(*c*) If no reactor is revealed as the result of such retest, the Certificate of Attestation will be nenewed for a further period of 6 months.

(*d*) If any reactor is revealed as the result of the retest, it must be immediately removed from the herd and the premises again disinfected. A second official retest will then be carried out at the expiration of 60 days from the date of completion of the last disinfection of the premises.

(*e*) If any additional reactor is found as the result of the second retest, the herd will be removed from the Register of Attested Herds and the Certificate of Attestation will be cancelled; and no further official test will be made until the conditions laid down in Rule 1 (*c*) are complied with, when the question of reinstatement will be considered.

(*f*) If no reactor is found as the result of the second retest, the Certificate of Attestation will be renewed for a further period of 6 months.

(*g*) During the period of suspension of the renewal of the Certificate of Attestation, the Rules applicable to Attested Herds will continue to operate unless and until the Certificate is cancelled in the manner indicated in (*e*) above.

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(4) *Records.*—The owner of an Attested Herd shall keep accurate records in the form of the Schedule annexed hereto of—

(*a*) All cattle on the premises comprising the Attested Herd, stating breed, age, sex and the marking, and the herd book number and name of animal, if any ;

(*b*) all births and deaths of cattle on the premises specified in the Certificate including cattle slaughtered ; and

(*c*) all bovine animals moved on to or off the premises specified in the Certificate, including the addresses of the premises from or to which they were so moved, the name of the vendor or purchaser as the case may be, if available, the date of movement and the purpose of such movement.

(5) *Marking.*—Every animal in an Attested Herd shall be marked by the owner in a manner approved by the Ministry or an Inspector of the Ministry.

(6) *Regulation of Movement of cattle to and from the premises of an Attested Herd.*—The following movements of cattle on to or from the premises of an Attested Herd are prohibited unless such movements are authorised in each case by a written permit issued by an inspector or other officer of the Ministry containing such conditions as are prescribed in the permit, namely :—

(*a*) *Movement on to the premises of an Attested Herd from any other premises.*

(*b*) *Movement from the premises of an Attested Herd to*

(i) the premises of another Attested Herd :

(ii) a market specially reserved and authorised by the Minister for the exposure of cattle from Attested Herds where no other cattle and no pigs are exposed ;

(iii) an agricultural show.

(7) *Conditions to be attached to all permits.*—The following conditions will be included in all permits authorising the movement of an animal issued under these rules, namely :

(*a*) During the movement the animal shall not be allowed to come into contact with any other cattle not being moved with a similar permit granted in accordance with these Rules, nor with any swine.

(*b*) The vehicle in which the animal is conveyed shall be cleansed and disinfected in the following manner immediately before the animal is placed in it :

(i) in the case of a *road vehicle.*—

The floor, roof and sides of the inside of the vehicle, and all other parts thereof with which such animal or any fodder, litter or other matter may come in contact, shall be scraped and swept, and the scrapings and sweepings and all dung, sawdust, litter and other matter shall be effectually removed from contact with animals ; the same parts of the vehicle shall then be thoroughly washed or scrubbed or scoured with water ; and

then be disinfected by being thoroughly coated or washed with a disinfectant approved by the Ministry of Agriculture and Fisheries.

(ii) in the case of a *railway vehicle*.—

The vehicle shall have been cleansed and disinfected in accordance with Article 24 of the Transit of Animals Order of 1927, since it was last used for the conveyance of animals, and in addition to such cleansing and disinfection it shall receive a further coating or washing of the floor, roof and sides of the inside with a disinfectant approved by the Ministry of Agriculture and Fisheries immediately before an animal from an Attested Herd is placed in it.

(8) *Additional conditions to be inserted in certain cases for movement on to premises of an Attested Herd*.—The following additional conditions will normally be inserted in permits for the movement of cattle on to the premises of an Attested Herd from any premises except from the premises of another Attested Herd, or from a market specially reserved and authorised by the Minister for the exposure of cattle from Attested Herds where no other cattle and no pigs are exposed, or from an agricultural show where special accommodation has been set apart for cattle from Attested Herds :—

(*a*) the animal must be certified by a veterinary surgeon to have passed the tuberculin test within 14 days prior to movement ;

(*b*) the animal shall on arrival on the premises be isolated from the remainder of the Attested Herd for a period of 60 days, provided that during that period only such contact with other animals in the herd shall be allowed as is necessary for breeding purposes ;

(*c*) at the end of the said period of 60 days the animal shall pass a further tuberculin test carried out by a Veterinary Inspector of the Ministry before it is added to the main herd ; if the animal reacts it must forthwith be removed from the premises and the part of the premises occupied by it must be disinfected.

(9) A permit for the movement of an animal from an Attested Herd to an agricultural show will be granted only in a case where special accommodation has been set apart thereat for animals from Attested Herds. Such a permit will be available for movement to one or more than one show providing special accommodation as above indicated but any animal so moved will be re-admitted to the same or to another Attested Herd only on condition that the animal is submitted to an official re-test as soon as practicable after a period of sixty days has elapsed since the date of return to or arrival in the herd ; if the animal reacts it must forthwith be removed from the premises and the part of the premises occupied by it must be disinfected.

(10) *Premises*.—The fences dividing the premises specified in the Certificate of Attestation from adjoining land shall be maintained to the satisfaction of the Ministry in such a condition as to prevent the infection of the Attested Herd by cattle on the adjoining land.

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(11) *Swine.*—With a view to prevent the risk of infection from swine kept on the same premises as the Attested Herd, the Ministry may by notice in writing require the tuberculin testing of such swine by a veterinary surgeon at the owner's expense, or impose such limitation on the free movement of such swine within the premises as he may consider necessary. Any swine that react to the test shall be disposed of as quickly as possible and that part of the premises concerned shall be disinfected.

(12) *Use of Milk, etc., for Feeding Animals.*—No milk or dairy by-product shall be brought on to the premises of an Attested Herd for feeding to animals except direct from the premises of another Attested Herd unless such milk or dairy by-product is pasteurised or sterilised by heat.

(13) *Entry and Examination by Inspector.*—The owner of an Attested Herd shall, while a certificate granted under this scheme in respect of the herd remains in force, give all reasonable facilities for the entry of an Inspector of the Ministry into the premises for the purpose of an examination of the premises, and of the animals thereon, and of the records required to be kept or permits issued for the purposes of this scheme, and for the testing of the animals. The owner shall furnish to the Inspector all such information as may reasonably be required by the Inspector for the purposes of the administration of the scheme.

(14) *The Certificate of Attestation may be Cancelled* by the Minister at any time at his discretion if in the judgment of the Minister the owner of the herd fails to observe any of these Rules or any additions or amendments thereto, and the Certificate shall thereupon cease to operate ; provided that in lieu of the cancellation of the Certificate of Attestation, part of the bonus payable to the owner of the herd for milk sold from the Attested Herd may be withheld for such period as may be determined by the Minister.

(15) *Consent of Ministry to Unofficial Tuberculin Tests.*—No animals in an Attested Herd shall be submitted to the tuberculin test without the consent of the Ministry. Such consent will not be withheld to a test carried out at a reasonable period before or after an official test.

(16) The Ministry may, if it thinks fit, at any time cause an official retest of all or any animals in the herd to be made. If any reactor is found, the Certificate of Attestation will be suspended and the Attested Herd will become subject to the provisions of paragraphs (*a*) to (*g*) of Rule 3.

(17) No claim will be entertained against the Minister in respect of any loss occasioned by the death, injury, or illness, however caused, of an animal submitted to any tests by or on behalf of the Minister.

(18) *Vaccination.*—No animals in the herd shall be vaccinated against tuberculosis during the period of validity of a Certificate of Attestation.

(19) These Rules may be extended by the addition of other Rules or may be amended by the Minister as may in his opinion be deemed necessary or desirable. All such additions and amendments will be immediately notified by the Ministry to the owners of all Attested Herds.

Ministry of Agriculture and Fisheries. January, 1935.

SCHEDULE

FORM OF RECORD REQUIRED BY RULE 4 TO BE KEPT BY OWNER OF AN ATTESTED HERD (*including Specimen Entries*)

Name of Owner of Attested Herd .....

Full address of premises where the herd is kept (specifying parish and county) .....

.....

No. in record	Herd Book No. and name of animal, if any	New Entrants.			Breed	Age	Sex	Mark	Manner and Date of Disposal.	
		Date	Births	Purchases, giving place of origin					Date	Precise destination
1								C.D.12(Ear Tattoo)	1st July	Sold in open market at .....
2									1st Aug.	Attested Herd of Mr. ..... at .....
3									1st Sept.	.....Agricultural Show at.....
4									1st. Oct.	Special Market at.....
.										
.										
.										
42	ax	30th Jan.	—	Bull from A.B. of ..... Glos.		18 months	M	XY 98	etc.	etc.
43	bx	1st June	From cow No. 3	—		—	F	etc.	etc.	etc.
44	cx	1st July	—	Cow from Special Market at.....		2 years	F	etc.	etc.	etc.

Clinical Articles

Retention of the Placenta in Sheep.

By ARTHUR J. WEIGHTON, M.R.C.V.S.,
Hull.

SEVERAL outbreaks of a very intense and fatal metritis have been observed to occur in flocks during the past two years, and the precise cause of the condition is still obscure. A typical outbreak is described below.

A flock of about 450 cross-bred Hampshire ewes was grazed on chalky land at about a hundred and fifty feet above sea-level. They were well kept, in good condition, and the accommodation for lambing was excellent. Both the owner and his shepherd were experienced and practical men, and no trouble had previously been known at lambing or any other time.

Out of one hundred ewes lambed the first week, four died on the second day, five on the fifth, and seven on the seventh. On the eighth day, March 8th, 1933, professional advice was sought. The history of all sixteen fatal cases was the same : the ewe lambed normally, a live lamb or lambs as the case might be, but did not cleanse. The sheep was well up to her time. Within eight to twelve hours she was obviously ill, blowing, unable to rise and refusing all food. Three to twelve hours later coma and death supervened. In some cases the cleansing had been removed by hand, but the end was always the same. Pessaries had been inserted, and various drinks administered without any good result.

Three ewes were ill at the time of visit ; of these, one had cleansed, and was able to walk, but there was complete inappetence, her temperature was 106.6° F., her respirations were laboured, and her membranes were very injected. The other two had not yet cleansed and were unable to rise, and as their temperature had dropped to 99° F. they were killed, and together with two of those which had died previously, were made the subjects of a post-mortem examination. The constant lesions were in the womb, and in addition one ewe showed signs of pneumonia ; otherwise all organs were normal in appearance. The womb lesions were acute endometritis with patches of necrosis ; the wall of the organ and the cleansing were easily torn. The inflammation was uniform in intensity throughout the organ.

The methods of the shepherd were above suspicion ; moreover, the same methods were applied to every ewe, whilst the disease seemed to attack particular ones without obvious reason. Sound evidence of contagion was also lacking ; indeed, the affected ewes did not seem to infect others at all. It was considered that the primary trouble was the inability of the sheep to cleanse properly, and since this same inability in cows has been thought to be due in many cases to a deficiency of calcium in the body, the deficiency theory was advanced in the instances under discussion.

Treatment of the affected sheep was mainly symptomatic ; affected ewes were separated as they were discovered, and attended to by one man. Pessaries of 3 per cent. lysol were inserted into each ewe three times a day, and the passage douched out with 1 per cent. lysol solution, while wherever possible the cleansing was removed by hand. Internally, ammon. carb., gr. xxx, with camphor, gr. xxx, was prescribed, and in many cases acted like a charm, both in forwarding the discharge of the cleansing and restoring the sheep to health. In all, eight more cases were seen, of which No. 1 died. Post-mortem examination of this one revealed the same condition as were described before.

The question of preventive measures provoked much thought, and eventually each ewe received in the food a tablespoonful of sterilised bone flour, to which was added five grains of powdered nux vomica and spices. In addition, a lysol pessary was inserted into each ewe after lambing, irrespective of whether they cleansed or not. After fifty more sheep had lambed, the trouble stopped quite suddenly, and the remaining three hundred of the flock lambed without incident, though the mineral mixture was fed right to the end.

Since that time some five outbreaks identical in character with this, and varying only in degree, have been encountered, and it is interesting to note that in every case a mineral mixture has been fed as a measure to cope with the disease. In two outbreaks this is all that has been done, and it is apparently all that is necessary, since the disease was checked. It is also of interest that all outbreaks have occurred on a chalky type of soil at altitudes varying from a hundred to two hundred feet above sea-level. All these flocks are now regularly fed on minerals before lambing time comes on ; no further trouble has been experienced, and their owners have expressed the opinion that minerals are worth their weight in gold, an opinion shared by the practitioner. It would appear that a calcium deficiency is the prime predisposing factor in these cases, though how the deficiency influences the animal economy, and what the actual cause of the metritis is, is still the subject of investigation.

Cicatricial Pyloric Stenosis, Gastrotomy and Dilatation. (Loreta's Operation.)

By DAVID ERIC WILKINSON, M.R.C.V.S.
Chigwell.

SUBJECT.—A black, short-haired, neuter cat, fifteen months old, 13 lb. in weight. History : Voracious appetite, constipation, occasional vomition, cries of pain on abdominal palpation ; admitted to hospital 18.4.1934. Examination : Palpation revealed enormous distension of stomach with some tenderness ; bowels empty. Palpation followed by vomition which apparently gave much relief. Vomit consisted of partially digested meat, eaten some forty-eight hours earlier. Passing of probang lubricated with liquid parafin under nembutal narcosis showed there was no œsophageal obstruction. Diagnosis : Pyloric

occlusion. Whilst narcotised the colon was washed out with normal saline solution. Twenty-four hours later the bowels acted, and the vertebra of a rabbit stained with blood was voided. Withdrawal of the probang was followed by a rush of inodorous gas, probably inspired air, from the stomach. Treatment: Mainly dietetic; animal fed entirely on milk. Discharged on 22.4.1934, apparently cured.

Subject: The same cat. History: On November 10th, the owner rang up and reported a recurrence of the symptoms previously shown: voracious appetite, bowels inactive and animal occasionally crying from pain. The usual devastating dose of castor oil had been given and was followed by painless vomition. Examination: Palpation revealed ballooning of the stomach which half filled the abdomen. Hypodermic injection of acetylcholine followed by gentle massage resulted in vomition of milk, whey and curds (estimated amount six ounces). Vomition revealed the animal's marked loss of flesh, but appeared to afford relief. Animal admitted for treatment on November 13th. Weight 10 lb.; temperature 100° F. Diagnosis: Cicatricial stenosis of pylorus. The owner was advised of the necessity for surgical interference, and, in view of the danger of death from starvation, gave consent

Preparation for Operation: All food was withheld, and the animal's strength maintained by daily hypodermic injections of glucose, ½ oz., in water 3 oz., at body temperature.

Operative Treatment: On November 15th, under nembutal narcosis and ether anæsthesia, an incision in the abdominal mid-line was made, extending from the xiphoid cartilage to just in front of the umbilicus. The stomach, duodenum and jejunum were lifted out on to a flat sponge. The stomach had now resumed its normal size, and showed no signs of peritonitis nor gastritis. On the left lateral aspect of the pylorus was some fibrous thickening which it was assumed interfered with the proper functions of that organ. (Three subsequent post-mortem examinations of normal pyloric tissue show this to have been abnormal in size and density.) No other abnormalities were visible in the organs exposed. Bowel clamps were applied across the middle of the stomach and across the duodenum about one inch posterior to the pylorus. The stomach was opened by an incision about three-quarters of an inch long in the longitudinal direction in the least vascular part of the greater curvature and a small probe passed through the pylorus into the duodenum. This was followed by the passage of a thick probe-director (7 mm. by 3 mm. in diameter) through the pylorus, and by rotation of the instrument in that position. The gastric wound was closed by interrupted Czerny sutures of No. 3 plaited silk, the peritoneum and abdominal muscles by one layer of interrupted sutures No. 4 silk, and the skin by No. 6 similar sutures. The external wound was painted with sol. acriflavin 1 in 1,000, and a bandage sewn on.

After-treatment (*Surgical*).—Skin sutures removed and bandage replaced on November 20th. *Medical:* Oral feeding was avoided, and from November

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15th to 18th, hypodermic injections of glucose solution were given each morning. In the afternoon hot milk and glucose were introduced into the colon. This colonic injection was retained for about three hours, until the 18th, when it was immediately expelled. Then one ounce Benger's food with three minims haliverol was administered orally. Three hours later two ounces of Benger's food given orally. Retained and caused no discomfort. On November 19th, the cat was fed every four hours from 6 a.m. to 10 p.m. on Benger's food with radiomalt. Animal now very strong, and vigorously resists forcible feeding, but will not feed himself. (N.B., a meat-fed cat.) Bowels acted normally. Next day cat took hot milk voluntarily without any discomfort. From this time onward recovery was uninterrupted, the diet being supplemented by plaice boiled in milk; the bowels acting normally daily and the patient regaining strength and weight. He was discharged cured on November 28th. Seen by the writer on December 18th: the animal is in his usual good health and condition, and shows no indication of severe illness.

Discussion.—From its more dainty habit of feeding, the cat is much less liable to pyloric wounding than is the dog. The latter animal unhesitatingly gulps large boluses, often consisting of sharp bones imbedded in softer tissues, which macerate off in the gastric juices, leaving the bone bared and ready to wound the next obstruction to its passage—the pylorus. It is probable that many of these cases are diagnosed as gastritis, and under palliative treatment recovery takes place; but cicatricial stenosis is not uncommon, and the writer has seen many such cases. The diagnosis of this lesion from the positive and negative symptoms outlined above should not present any insuperable difficulties to the careful observer. If desired, diagnosis may be confirmed by X-ray examination, by which the "ballooning" of the stomach by inspired air, the churning movements set up by the antiperistalsis, and the occlusion of the duodenal orifice can readily be seen.

Abstracts of Current Literature

Equine Pregnancy Diagnosis Service. *The Thoroughbred Breeders' Association Eighteenth General Meeting.*

THE Secretary read the following, which had been received from Professor W. C. Miller:

"Before making a statement regarding the year's work, I would like to take this opportunity to express my thanks to the members of the Thoroughbred Breeders' Association for their generosity in making available a sum of fifty guineas for the conduct of the service for a second year in succession. The subscriptions received have enabled the service to be continued without interruption, and a small reserve fund has been accumulated, so that had it not been for

a circumstance concerning which mention will be made later, there would have been little doubt that a fair measure of security would have been achieved for the future. During the past year it has been possible to reduce the charge per mare from 10*s*. to 7*s*. 6*d*. to members of the T.B.A., as a small concession and practical acknowledgment of the assistance received from the Association. The charge to non-members has remained at 10*s*. Every effort will be made to maintain these charges in future.

" Over 2,000 *samples* have been dealt with up to date, comprising about 80 per cent. from thoroughbred mares and 20 per cent. from all other breeds. Of these, 1,053 mares gave positive and 644 mares gave negative results, while 48 were doubtful at the first test, and either positive or negative subsequently. During the early part of the season, until the beginning of August or so, a considerable number of pregnant mares from about the fifty-fifth to eightieth day after service, gave very weak positive reactions. Some difficulty has been experienced in arriving at a reason for these weak positive reactions, and while it is impossible to be certain, the fault would appear to have lain with the dry season and the quality of the grazing during spring and early summer. With an excessively dry summer the grass is deficient in succulence and in proteins, and hormones which are manufactured in the system probably suffer in consequence—among them being the particular hormone (œstrin) on which the test depends. After the wetter weather arrived, the frequency of weak positive reactions decreased and disappeared.

" One other matter must be referred to for the information of members who may send samples and experience disappointment in receiving an indefinite, or doubtful, report. Young maiden mares, and old mares which either have not been bred from before or have missed the two or more previous seasons, are much slower than normal in mobilising their œstrin-secreting mechanism. The amount in them at 60–70 days after service is often, we find, but little more than is put out by normal brood mares during the time they are ' in season.' This leads to a difficulty in interpreting the results. I have made a point of endeavouring to persuade owners to submit a second sample in each of these cases, after an interval of some ten to eighteen days. In the great majority of such cases the second test has been either a definite negative or positive. In a very few instances (not more than half-a-dozen) a third sample has been required.

Accuracy of Record Cards.

"I would like to take this opportunity to stress a point which is of some importance. It would greatly facilitate the carrying out of the test if owners would ensure that record cards are filled in as completely and accurately as possible and returned with the sample. Not infrequently samples arrive without owners' names or addresses, and with no indication of the name, breed or age of the mare, nor of the duration of expected pregnancy. We test these samples, but can do nothing more. Usually, in two or three weeks or more, I get a fierce

letter from an irate owner asking just exactly why he has had no report on the sample sent, nor any acknowledgment of his 10*s*. Treasury note—if it so happens he has sent it. It is really much more convenient for all concerned if those who wish tests carried out sent a post card asking that containers, sample bottles and record cards be sent to them. We put owners' names and addresses on the cards before they leave, and this ensures the sample having an identification when it is returned to me. No extra charges are incurred, postages are included in the costs of the test.

"With regard to accuracy of the test during the year, I am afraid that results up to date are not complete. I have found considerable difficulty in obtaining the actual details of mares from which samples have been tested. I feel sure that in many cases this has been due merely to inadvertence, but it would be of very great assistance if owners would make a point of returning the circulars asking whether the tested mares produced a foal or not.

"Some 556 confirmatory returns have been received out of a total of 703 for last season (1934). Of these, 497 were correct and five were definitely incorrect. Of the other 54 tests some were duplicates, and others were doubtful results, about which it has been impossible to obtain definite information, since there is evidence of abortion in some, and in others of diseased ovaries. This gives a higher percentage of inaccuracies than in the previous years, but I think the probable reason is that very many more samples were received from mares in the early stages of pregnancy—especially between forty and sixty days after service. I think it is desirable to point out that the great majority of mares *do not produce a sufficient amount of œstrin in their urine to enable the test to be reliable until after the sixtieth day at least.* Where a negative result is obtained before the sixtieth day, a second sample should invariably be submitted to test. On the other hand, a proportion, probably between 20 and 30 per cent., of mares do yield good positive results by the fortieth or forty-fifth day, and a few mares give satisfactory positives at the thirty-fifth day.

Developments During the Year.

"A brief mention was made previously that a second test animal was available in addition to the mouse. During the year, my colleague, Dr. Greenwood, has shown that the Brown Leghorn capon can be used to determine the presence of œstrin in a sample of equine urine within forty-eight hours. A change in the colour of the growing breast feathers from black to salmon-colour occurs after injection of œstrin. The test is at least as delicate as the mouse test, but owing to the cost of keeping capons it is not proposed to make use of fowls for routine tests in the meantime at least. The obvious advantage of a result within forty-eight hours of receipt of the sample is considerable, and it may be that we may explore this possibility further in future. (If anyone interested cares to communicate with me personally, I have available a limited number of reprints of an article on equine pregnancy diagnosis published recently in the *Proceedings of the Royal Society*, which gives a detailed account of various aspects of the subject.)

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" I might mention that from a sample of blood serum it is now possible to determine pregnancy in the mare with a high degree of accuracy from the fortieth day after service onwards. We have decided not to urge owners to make general use of this type of test in the meantime ; but where there is some urgent reason for arriving at an early diagnosis I would be prepared to carry out a limited number, provided a week's notice is given previously to enable me to prepare the test animals, which are treated differently from those for the ordinary urine test. The sample of blood must be taken by a veterinary surgeon with special precautions, and arrangements must be made between owner and his veterinary surgeon privately. The cost for the blood serum test would be £1, which does not include the veterinary surgeon's fee.

ARRANGEMENTS FOR 1935.

" I have to intimate that no samples can be tested between December 27th and January 14th, and that on and after that date samples must be addressed to me at the Royal Veterinary College, Camden Town, London, N.W.1.

" The testing of samples will not be carried on at this Institute after I leave to take up the duties in the Royal Veterinary College concerned with the Courtauld Chair of Animal Husbandry, to which I have been appointed. The Pregnancy Diagnosis Service will, however, continue to be carried out under the same arrangements as before, from the Royal Veterinary College, under my control. A circular letter will be forwarded to owners, veterinary surgeons and others who have made use of the tests in the past."

The above report was discussed, and the Secretary was instructed to write thanking Professor Miller for his letter and report.

Lameness in Cattle in Cyprus. By ROBERT RAE, M.R.C.V.S., D.V.S.M.
Annual Report of The Veterinary Officer for 1933.

THIS condition is one which causes considerable loss to farmers in many parts of the Colony. Although it has for long been presumed to be a " deficiency " disease, its nature has not yet been properly investigated. Clinically the cases bear a close resemblance to " styfsickte," a disease which is caused in South Africa by deficiency of phosphorus. The lameness usually appears in the winter months, and is most frequently seen in working cattle after the ploughing season has commenced. As the affected animals are usually slaughtered, the number of cattle available for agricultural work is reduced at a time when they are most required. In some cases the lameness tends to extend from one leg to the other limbs, in other cases it shifts alternately from one limb to another. Sometimes a slight thickening of the pasterns may be observed, in other cases there is apparent enlargement of the epiphyses of the bones, and in other cases there is no noticeable alteration. Heat in the hoof is not usually present in the cases now being discussed. (Cases of simple laminitis also occur frequently in cattle which are over-

worked after a long spell of rest.) After the lameness has persisted for periods varying from a week to a month, the affected animals usually become unable to rise and are then slaughtered. Frequently futile attempts to raise them result in fractures of the pelvis or other bones.

Facilities are not at present available for bio-chemical examinations. These cases frequently occur in areas in which the soil and water contain a liberal amount of calcium and in which the rations fed to the cattle consist largely of chick peas (*Cicer arietinum*) with chopped wheat straw. The majority of Cyprus cattle are fed green food (green barley or green oats) only for a period of one to two months in the spring of each year, and it has been observed that cases of this lameness of cattle are most frequent in a winter season following a spring in which the crops were below normal, and in which consequently very little green forage was available.

Peculiar Fungoid Infection in the Skin of Goats and Sheep (Favus). By Lars Slagsvold, Director of the State Veterinary Clinic, Oslo. *Norsk Vet. Tdskr.*

In Norway, especially in the comparatively rainy western districts, there occurs a skin disease among sheep and goats caused by a particular kind of fungus. This disease (Favus) has earlier been described by Ivar Nielsen (1910). Neglected care of the skin together with cold and dampness favours the development of the disease. Goats are most troubled thereby, especially the young animals. There occurs desquamation of the epidermis or scurfy incrustations on the head, ears, neck, along the back, on the inner side of the joints of the limbs, etc. The disease is not accompanied by itching. The fungus vegetates only in the epithelial layers. It can best be cultivated on ordinary neutral or slightly acid agar, to which from ½ to 1 per cent. of maltose and from 5 to 10 per cent. of horse serum has been added, or in bouillon, with addition of maltose and serum. The cultures stain best by Gram's bacteria-staining method. Dr. Schouten (Utrecht) has made investigations in order to determine the nature of the fungus, and he assumes it to be a species of monilia.

By means of pure cultures a typical form of the skin disease has been produced in sheep, goats, horses, oxen, guinea-pigs, rabbits, rats and mice. The fungus can maintain itself for half a year in dried skins, likewise in serum-agar culture at ordinary room temperature or in refrigerator. It is killed by heating for half an hour at 65° C., and likewise by subjection for a short time to the influence of relatively weak concentrations of arsenic, creosol, iodine or chlorine preparations. The disease can be combated in an effective manner by protecting the animals from uncleanliness and continuous dampness, as well as by bathing in autumn and spring with ordinary vermin-wash (cresol preparation or arsenic solution).

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News

OWNERS OF VETERAN WAR HORSES ENTHUSIASTIC SUPPORT OF ROYAL VETERINARY COLLEGE HOSPITAL GIANT NOSE-BAG 250,000,000 FARTHING ENDOWMENT FUND.

THE Royal Veterinary College Hospital is receiving, from many influential quarters, the strongest support for the *Giant Nose-Bag* 250,000,000 *Farthing Endowment Fund.*

Through the kindness of Mr. Bertram Mills and of his co-directors, the Giant Nose-bag itself was on exhibition for the whole of the five weeks' session of the Bertram Mills Circus at Olympia. The nose-bag was mounted on the same smart little trolley as that on which it appeared in the Lord Mayor of London's Show, and was at first stationed in an alcove in the stables.

It was surrounded by a wooden framework on which were pasted the printed records of the Veteran War Horses—some thirty different cards. On the cross beam of the framework were the words: "By the sporting generosity of their owners *all* these horses are supporting the Fund by carrying Army regulation nose-bags—converted for collecting purposes." A sample Army collecting nose-bag was shown, and, by way of contrast, dainty miniature nose-bags (six inches by four inches) were to be seen dangling over the surface of the Giant Nose-bag. And each miniature had peeping from it a tiny wisp of hay. The latter was a realistic touch made by Mr. Ernest Dix, the Stud Groom of the Circus, who was placed in charge of the Giant Nose-bag, by Major Arthur Sowler, the Master of the Horse.

Lady Eleanor Smith and "Wee MacGregor."

Later the Giant Nose-bag was moved to a more open position near the "Commodore" London to Rochester coach, and attracted a great deal of attention; and for the last two weeks of the circus was included in its arena procession at every performance, the trolley being drawn by a black Shetland pony.

At the Circus Fans' Association Banquet, held in the arena at Olympia during the very early hours of Saturday, January 12th, "Wee MacGregor," a piebald pony, wonderfully caparisoned, was led round all the tables, and carried a Farthing Fund Nose-bag on his forehead. Every guest dropped a "bean" into "Wee MacGregor's" little nose-bag, which was quickly filled, and then handed over by Lady Eleanor Smith (the Chairman) to Sir Frederick Hobday.

In the course of proposing the toast of "The Animals" at the banquet, Sir Frederick said: "It was in this very building, at the International Horse Show last June, that *twenty-four* Veteran War Horses were paraded in great honour. That parade was greatly conceived, and magnificently carried out. . . . At this very moment *twenty-three* of those selfsame horses are helping to endow the Royal Veterinary College."

Toy Rocking-Horse presented to Mr. Bertram Mills at Olympia.

To mark the appreciation of the Royal Veterinary College Hospital for the generous assistance given to the Giant Nose-bag Farthing Fund, Sir Frederick Hobday, on Saturday morning, January 19th, at a private function in the circus arena, made a personal presentation to Mr. Bertram Mills.

This took the novel and interesting form of a wooden barrel-bodied toy rocking-horse, Nose-Bag the First, standing some four hands high. The lower

stand was painted in the Bertram Mills colours of green and Mexican red; and the galloping, wild-looking, dapple-grey steed — void of horse furniture—was mounted by a gaily-painted extravagant figure of a crazy-eyed top-hatted clown bursting through a hoop. The toy, designed and painted by Miss Jennetta Vise, was stamped on its rocker with the seal of the College, and bore the following inscription :

" Presented—out of gratitude—to Bertram Mills for his very generous services to Animals, especially to the Sick and Helpless, for whose benefit the Royal Veterinary College Hospital Giant Nose-bag 250,000,000 Farthing Fund was initiated."

Mr Mills, when smilingly accepting the rocking-horse from the professional hands of Sir Frederick, expressed himself as being really delighted with such an appropriate present, and warmly congratulated the young artist on the true spirit of humour displayed in her work. An excellent photograph appeared in *The Star* of the presentation, and an appreciative notice was published in the *Manchester Guardian*.

Sparkford Vale Harriers' Nose-Bag Collection.

Following upon an announcement in its previous week's issue that the Sparkford Vale Harriers were holding a " Nose-bag for the Royal Veterinary College," *Horse and Hound*, of January 10th, stated that " the sequel was seen in a photograph published in the *Daily Mirror*, on Tuesday, which bore the following caption :

" Three comrades of the Great War—Major G. C. S. Hodgson, Master of the Sparkford Vale Hunt, with his old war-horse Jack and his war-time batman, Mr. E. Knight, who is now his groom—at yesterday's hunt near Yeovil, Somerset. The horse, which is twenty-four years old, *collected, in his nose-bag, funds for the Royal Veterinary College Hospital.*"

Will those who would " do likewise," please write at once to O/C Veteran War Horses, Royal Veterinary College, Great College Street, Camden Town, London, N.W.1. It would be easier still to telephone—Euston 1334.

T. V.

GIN TRAPS (PROHIBITION).

A Bill to prohibit the manufacture, sale or exposure for sale, or use, or having in possession or custody of gin traps.

Be it enacted by the King's most Excellent Majesty by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same as follows :—

1. (1) Subject to the provisions of this Act it shall not be lawful for any person to manufacture, sell or expose for sale, or use, or knowingly to have in his possession or custody, any gin trap.

(2) In this Act the expression " gin trap " means a trap so constructed that, in its normal operation, it catches mammals or birds alive by gripping a limb by means of jaws, teeth or clamps in such a manner as to cause pain.

(3) If any person acts in contravention of this Act he shall, in respect of each offence, be liable on summary conviction, in the case of the first offence to a fine not exceeding five pounds, and in the case of a second or subsequent offence to a fine not exceeding twenty-five pounds or to imprisonment not exceeding three months, or to both such fine and such imprisonment.

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(4) The Court before which any proceedings for an offence under this Act are heard may direct that any gin traps in relation to which the offence was, or was alleged to have been, committed shall be forfeited, and any gin traps so directed to be forfeited shall be destroyed in such manner as the Court may direct.

(5) Nothing in this Act shall be taken to prohibit any museum, society or institution having possession of a gin trap solely for the purpose of exhibition.

2. (1) This Act may be cited as the Gin Traps (Prohibition) Act, 1934.

(2) The provisions of this Act shall not extend to Northern Ireland.

(3) This Act shall come into operation on the first day of January, nineteen hundred and thirty-six.

Gin Traps (Prohibition)—Memorandum.

Objects of the Bill.—This Bill is to abolish the gin or jaw trap (commonly known as the " steel trap ") as a means for catching mammals and birds. The objections to the use of this trap are that (1) it inflicts severe and prolonged suffering on wild animals and birds ; (2) it endangers domestic animals, which frequently are caught by it ; (3) it destroys the fauna of the countryside ; (4) it is the basis of the practice of harbouring and preserving rabbits in greater numbers than the land can advantageously support, with the result that crops, grazing-land and young forests are subjected to great damage. While the interests of the commerical trapper and rabbit-preserver require that rabbits should be as numerous as possible, the interests of the farmer, forester and land-owner require that they should be kept down. Experience has shown that far from being necessary for keeping down rabbits, the intensive use of the gin or steel trap is associated with an increase in rabbit-population. For instance, the introduction of the gin into Pembrokeshire and part of Carmarthenshire has produced a plague of rabbits, while the remainder of Carmarthenshire is comparatively free from these destructive animals.

Alternative to the gin or steel trap.—That various means superior to the steel trap are available for keeping down rabbits has been proved by a thorough investigation conducted by the University of London Animal Welfare Society, which has promoted this Bill. The means available for taking or killing rabbits under various conditions include the long net, with or without devices for daylight setting ; purse nets, ferrets, digging out ; motor-car exhaust gas, cyanogas ; specially constructed snares of quick-killing types ; the knotted snare (R.S.P.C.A. snare) ; shooting. These methods may be used separately, or in combination with one another and/or with trenching, calcium carbide, anomoil, renardine or bolting-fuse. The gin is used for various other wild creatures also, though the numbers concerned are much smaller than the number of rabbits. Humane methods appropriate to each species are, however, available.

Previous legislation.—With the exception of the first of the following Acts the existing law cannot usually be enforced without access to private land. The provisions of the present Bill could be enforced without any access to private land. (1) The Spring Guns Act, 1827, prohibits *inter alia* the setting of man-traps except in Scotland or in dwelling-houses at night. (2) The Ground Game Act, 1880, prohibits the setting of " spring traps " elsewhere than in rabbit-holes, though the Courts have held that this prohibiton applies only to tenants of land (Smith *v.* Hunt, 1886–50, J.P. 280 ; May *v.* Waters, 1910–1 K.B. 437 ; Leworthy *v.* Rees, 1913–109 L.T. 244) ; (3) The Protection of Animals Act, 1911, prescribes that " spring traps " set for hares or rabbits must be visited once a day between sunrise and sunset ; (4) The Wild Birds Protection Act, 1904, prohibits the

setting of any " spring trap, gin or other similar instrument calculated to cause bodily injury to any bird coming in contact therewith " on any pole, tree or cairn ; (5) the Rabbits Bill has been unsuccessfully introduced in Parliament several times. It would give power to County Councils to take steps for keeping down rabbits while prohibiting them from using " spring traps " for the purpose. It encountered opposition on the ground that it could not be made effective without access to private land. The present Bill, on the other hand, could be enforced without the requirement of any access to private land.

University of London.

Special University Lectures in Veterinary Science.—A course of two lectures on " The Importance of the Veterinary Profession in Public Health Administration " will be given at The Royal Veterinary College, Camden Town, London, N.W.1., by Major D. S. Rabagliati, O.B.E., B.Sc., F.R.C.V.S., D.V.S.M., Chief Veterinary Officer to the County Council of the West Riding of Yorkshire, at 5.30 p.m., on Thursdays, February 28th, and March 7th, 1935. Syllabus : Lecture I.—" The growth of legislation in Great Britain dealing with the control of animal disease, especially in respect to those diseases intercommunicable between animals and man." Lecture II.—" Milk and its relation to public health, with special emphasis on the value of veterinary science in ensuring a clean milk supply." At the first lecture the Chair will be taken by Professor W. W. Jameson, M.A., M.D., F.R.C.P., D.P.H., Dean of the London School of Hygiene and Tropical Medicine. The lectures are addressed to students of the University and to others interested in the subject. Admission free, without ticket.

Correspondence

NASAL AND BRONCHIAL CATARRH.

To the Editor of THE VETERINARY JOURNAL.

I HAVE read Mr. W. M. Scott's article with interest, but I am afraid I have not gained much benefit from it. Why the learned disquisition about *pus* in a dissertation on bronchial and nasal catarrh ? Pus does not enter into the matter where catarrh alone is concerned. According to masters of pathology : " Catarrhal exudates may be thin and watery, or thick and viscid, and consist chiefly of desquamated cells and leucocytes mixed with an increased quantity of mucin."

My aim in using solutions (not necessarily antiseptic, as Mr. Scott assumes) is to dislodge discharge and increase the secretion of mucous membranes, *e.g.*, the use of ammonium chloride solution, which is undoubtedly beneficial in chronic inflammations of the throat and nose. That it is useful the eye can see, when if used on a horse's nostrils in catarrh, or into the back of the throat when clogged with mucus, a grand total of discharge comes away, and the animal shows relief by easier breathing. I do not agree that inhalations are futile, or that you cannot occasionally, especially in the human subject, cut short a catarrh. After being catarrhed at night, and using ammoniated tincture of quinine and an inhalation of Friar's balsam and terebene I have been as good as ever next day. If inhalations do no good then the air of Bournemouth is masquerading under false pretences, the effect of Friar's balsam is chimerical, and the old and tried bronchitis kettle

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a farce. Many patients who have benefited by these means will not lose faith in them.

As for the use of vaccines in catarrh, I suppose I am not up to date in not mentioning them, but I omitted referring to them because they seem to be so futile. Four friends of mine underwent vaccination for catarrh a few years ago, and they and the doctor, too, agreed that no good results occurred. A lady I know has had auto-vaccination for catarrh for a period of eight consecutive years, and she still smiles and snuffles.

The object of using powders as an insufflation is more to make the horse sneeze than anything else. "The proof of the pudding is in the eating," and where horses have to be got to work in good time and no cases of nasal gleet or strangles ensue, then I think the procedure I indicated in my article is worthy of consideration and adoption.—I am, Sir, yours faithfully,

GLADSTONE MAYALL.

REFERENCE.

"Veterinary Pathology and Bacteriology": S. H. Gaiger and G. O. Davies.

Personal

CAPTAIN LOUIS MITCHELL, M.R.C.V.S., of St. Leonards-on-Sea, retired veterinary surgeon, who died on October 20th, aged seventy, left estate of the gross value of £13,237, with net personalty £13,049. He left £100 to the Victoria Veterinary Benevolent Fund.

ERRATA.

Review of "The Internal Parasites of Domestic Animals," by Professor Thos. Cameron, T.D., M.A., Ph.D., D.Sc., M.R.C.V.S., should read:

"The study of helminthology has always had a definite comparative—one might almost say veterinary—side, and the Royal Veterinary College at Camden Town always cherishes the name of Cobbold, and is proud that he was once one of its teachers; whilst the work of Leiper, and the early encouragement he unselfishly gave to his friend and pupil, Cameron, has added much to our useful knowledge, and has led to the practical application of remedies for the extermination of these detrimental animal pests."

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